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Foreword 1928

THE Editorial Board with the first issue in the New Year desires to thank all those who have assisted by their contributions in maintaining the usefulness and high character of the *Journal* during the past year. It would acknowledge particularly the valuable assistance received from the chairmen of the several provincial boards. The Managing Committee is pleased to be able to announce that the circulation of the *Journal* during the year has greatly increased, and that its monthly issues are now to be met with in every important medical centre in Europe as well as in America.

The Canadian profession, in the opinion of the Board, may regard with some pride the number of notable papers, both clinical and scientific, which have appeared in almost every issue during the past year; all of them representing much careful observation and scientific research on the part of the writers. In this connection the Board would call the attention of contributors to the fact that the *Journal* is the recognized organ of the Canadian Medical Association. Medical articles by Canadians appearing in foreign magazines are, as a rule, credited to the country in which they are published.

It is with pleasure that the Editorial Board announces that it has secured the services of Dr. Albert G. Nicholls, M.A., M.D., D.Sc., F.R.S.Can., to assist in the ever-increasing work demanded by the growing size of the *Journal*. Dr. Nicholls is already well known to the English speaking profession in every country, and has had a long and varied experience both in medical and literary fields. It is hoped that

with his assistance the editorial staff may be able not only to add to the efficiency and ability with which the *Journal* has been conducted, but also to enlarge the foreign field from which its abstracts are obtained.

The Editorial Board desires again to call the attention of medical men in each province to the importance of having their aspirations, as well as their difficulties, made known to their confrères in other provinces by means of occasional communications or letters to the *Journal*. Only in this way can the profession become unified, and each member appreciate sympathetically the wants and desires of colleagues in other sister provinces.

Furthermore, the Board desires emphatically to call the attention of its readers to the importance of collecting as promptly as possible all historical and biographical data regarding the early days of the profession in Canada, East and West. A few interesting biographical sketches of leaders in medicine in the early years of our country have already appeared in our pages. The Editorial Board would appeal again at the beginning of a new year, not only to the members of every Canadian university, but also to every member of the profession to collect all possible biographical items regarding worthy predecessors. It is from every point of view desirable that we of to-day should honour the pioneers of the past; especially those of our own country.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS*

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A SURGICAL operation such as that of total extrapleural thoracoplasty for unilateral pulmonary tuberculosis, not many years ago, was regarded by most internists as a piece of folly, not untinged by knavery. Things are different now. The courage of the pioneer has once again justified itself, for it was based on sound pathology and physiology. Sauerbruch has operated on over 700 cases and his work is everywhere accepted. Alexander's recent book, awarded the Quinquennial Samuel D. Gross Prize for 1925 by the Philadelphia Academy of Surgery, embraces a critical analysis of five hundred articles upon the subject of the surgery of pulmonary tuberculosis and is a record of the very rapid widening of this field within the last ten or fifteen years. The bulk of the work hitherto we owe to Germany, Switzerland and Austria. Yet we, on this side of the water, have recently "caught on." Enthusiasm is spreading rapidly, in some cases too rapidly perhaps for discretion; and I think I perceive in this particular field of therapeutics the imminence of a danger which is apt to attend any new operative procedure—eagerness untempered by judgment; a very human impulse of pity uncorrected by knowledge; an enthusiasm which regards not caution.

In this idea I have thought it worth while to devote the major portion of this paper to a consideration of the general pathological aspects of pulmonary tuberculosis in the light of their application to the selection of patients for operation.

Let me, by way of introduction, say a few words of a general nature.

The operation in question is now more or less standardized. Its accepted title is extrapleural thoracoplasty. It consists in a resection of several inches of all the ribs of one side posteriorly, from the first to the eleventh, a resection which keeps outside the parietal pleura. That side of the chest wall consequently falls in, and the inward spring of the rib stumps compresses the lung, which also of its own motion collapses, to a certain extent, by reason of its elastic structure, in so far as that is preserved. Respiratory movements, dependent as they are upon rib movements, cease in great part, and the lung is given physiological rest. Such is the reason of the operation, and such is also the basis of ancillary operations—phrenicotomy to paralyze the diaphragm; the cutting of pleural band-adhesions which restrain the lung collapse of an otherwise good pneumothorax; the "plombierung" operations with apicolysis designed to compress strictly localized cavities in the upper lobe. All these I leave out of the discussion in this place. Nor can I take up, unless very briefly, other variants of the surgical problem, such as the place of thoracoplasty as opposed to artificial pneumothorax, total or partial; partial thoracoplasties for limited disease; partial thoracoplasty combined with partial pneumothorax; the treatment of pyopneumothorax, with or without bronchial fistula; and other minor particularities. The subject then is here confined to uncomplicated chronic pulmonary phthisis, usually with cavitation, as seen in later adolescence and in adults, for which the standard extrapleural thoracoplasty is now generally accepted as not only a justifiable but a very gratifying procedure in selected cases.

All sound therapy, surgical as well as medical, rests upon a pathological basis. Before we can presume to do such a serious thing as an extensive

* An address delivered as the Mütter Lecture, December, 1925, before the College of Physicians, Philadelphia, but with statistics brought up to date.

operation upon such frail material as is represented by the far advanced tuberculous patient it is our duty to be familiar with the pathology of the tuberculous lung, as well as with the clinical course of the disease. Fundamentally, the extent of the disease, its type, and its mode of progression, depend upon the interaction of two opposing forces, the organism in its varying degrees of virulence, on the one hand, and on the other the defensive power, or resistance, of the host. The resultant effect represents the pathological condition of the lung at any given moment. But it is not only this that we have to estimate. In the endeavour to form a judgment upon the advisability of surgical interference in the patient as he comes to us for an opinion, we must look both backward and forward. We must ask ourselves, what has been the clinical course of the disease hitherto; what measure of the ordinary hygienic treatment has he enjoyed; what evidence has he given of resistance; and for the future, what is likely to become of him should no operation be attempted?

The Pathological Aspects in the Uncompressed and the Compressed Lung

It would seem that the pathological classification, which has been so well worked out by the Germans, particularly by Ranke, by Fraënkel and Albrecht, by Aschoff and Nicol, into two main types, the exudative and the productive, is applicable to clinical work in a most advantageous way. The histological reaction in the exudative form, which is always a more or less acute process, consists in the collection of a fibrin-containing fluid in the lung parenchyma, together with the usual cell elements, represented by lymphocytes, polynuclears, red cells, and cells exfoliated from the alveolar walls. The amount of fluid thrown out, in and around the foci of bacillary irritation, approximates the condition to that of lobular, or even lobar pneumonia. And when one considers the fate of such a tuberculous exudate, one must keep in mind, as has been convincingly demonstrated by the x-ray work of recent years, that resorption of the exudate, within the space even of a few months, may be almost complete. An acute exudative tuberculosis may disappear almost like an ordinary lobar pneumonia. Yet such, of course, is not the usual result. Caseation begins in the middle of the cell exudate, progresses, and involves the alveolar wall and the surrounding lung parenchyma with the stroma. A restoration to normal is then impossible. Failing further progression, the caseous focus with its surrounding granulation tissue may dry up, and may be turned into scar with a surrounding ring, or capsule, of fibrous and hyaline tissue, in which calcification may ultimately appear. Or, on the other hand, the caseous focus may break down and the end-result be cavity .If resistance is strong, this exudative acute form may turn into the chronic productive type. If not, it goes on to bronchopneumonia or pneumonic phthisis.

The productive form is characterized by a relative absence of fluid exudate. It leads rather to the formation of the typical tubercle and tuberculous granulation tissue, such as we are accustomed to see depicted in our student textbooks. The tubercle, in its early stages, is composed of endothelioid cells, which in places fuse and form giant cells; these are surrounded by lymphocytes, alveolar cells, and proliferated cells from the stroma and vessel walls. The number of giant cells, the relative isolation of the tubercle, and the lack of surrounding fluid exudate are considered as a measure of the productive type of reaction. Such a tubercle is apt to destroy the tissue of the host more or less completely, in its own microscopic field, and in particular the elastic fibers. A *restitutio ad integrum* is impossible; but, in revenge, the defensive forces of the host play here a stronger rôle than is usual in the acute exudative form. While caseation of the centre of the tubercle, with sloughing out, expectoration, and the formation of small cavities, frequently occurs, it is perhaps no less frequent to observe a hyaline and fibrous transformation of the whole tubercle into a solid scar; or at least the formation of a dense, fibrous capsule around a minute, inert, caseous mass. The exudative form is generally held to represent an acute process, and to be the result of a massive or highly virulent infection; the productive type to be the result of infection by a few bacilli, to which is opposed a strong defence. In general the latter tends toward healing, the former toward breaking down. The one is nodular, the other is pneumonic or bronchopneumonic in type.

The gross distinction between these two types has, naturally, been made, with reasonable accuracy, by clinicians on the basis of physical examination and constitutional symptoms; but it cannot be denied that the clinician, during the last twenty years, has come to rely also, and to an extent which the more conservative man is sometimes loth to admit, upon the help of the

x-ray picture. X-ray technique, in the hands of specialists, has now reached a high state of perfection. I need only refer to the beautiful work of Kennon Dunham in this country and of Graeff and Kuepferle in Germany. In regard to the present question of the distinction between the exudative and productive forms of lung tuberculosis we are told that in most cases the x-ray picture is able to settle the matter. On account of the surrounding fluid exudate the x-ray picture of the lesion in the exudative form shows a foggy outline, while the tendency to fibrosis of the productive form is represented by a sharp outline. Taken rigidly, so sharp a distinction is not always justifiable. At least, if one is to make it, the technical details must be absolutely identical in successive pictures. Varying degrees of lung inflation, the distance from the plate of any given tubercle, differences in development, constitute variable factors which may give confusing pictures. And at best the x-ray picture can only be accepted as one among several factors in coming to a decision concerning the type of lesion present.

A further consideration lies in this, that the two forms are frequently simultaneously present, with one of them predominating; or that they succeed each other. Although I lack that intimate knowledge of the clinical course of tuberculosis in its medical aspect which is enjoyed by the sanitarium expert, and is the legitimate fruit of long and close observation, I cannot but believe, with Sauerbruch, that the fundamental factor controlling the progress of the disease is afforded by the natural resistance of the individual patient, and that in general, whether in casting a prognosis or in considering the danger and the benefit of operation, we must be guided by the principle that the exudative form represents activity and a poor defense, and is consequently dangerous, while the productive form means chronicity, a good defense, and therefore relative safety. Resistance is the keynote to prognosis, and I would like to say with all the emphasis at my command, that in respect of surgical operations upon the tuberculous patient, some evidence of resistance must be demanded. Upon that rock must the *ecclesia* of surgical treatment in this disease be built.

Now the evidence of resistance on the pathological side can be summarized in one word—scar. The end of all injury, the end of all disease which has produced destruction of any degree, is scar; and the scar comes through fibrosis. In this sense one may, in a measure and for practical purposes, disregard the various pathological and clinical classifications of the pulmonary tuberculous lesion. The use of such terms as "acinar-productive," "acinarnodose," "acinar-exudative," "lobar-caseating," "lobular-caseating," "cirrhotic," "fibroid," "ulcerative," and so on, while indispensable for anatomical descriptions, may be in large measure left aside by the internist or the surgeon, when the question of operation has to be decided, provided the evidence of a reasonable attempt on the part of the patient to control his disease, through fibrosis and scar contraction, is found. This is the least common denominator. Practically it means some healing, preferably a good deal of healing, and not too great destruction. How, then, are we to arrive, in practice, at a precise estimate of healing? The building has four cornerstones: clinical course, constitutional symptoms, physical examination and the x-ray picture. It is obvious that in respect of all these judgment, in the first instance, and indeed mainly, belongs to the province of the specialist in pulmonary tuberculosis, or of the trained internist; and the majority of patients hitherto referred to the surgeon for operation, have come from sanatoria. Is the surgeon, then, to play the rather minor rôle of carpenter? That is neither necessary nor advisable. As a matter of fact, while the original conception of a surgical operation for certain cases of pulmonary tuberculosis came from a medical man, the chief advance in our knowledge, not only of surgical technique but of indications, contraindications, prognosis and therapeutic results, has come from a surgeon. The surgeon draws from a whole circle of internists. Contrast, for instance, the experience of Sauerbruch, with his grand total of over 700 cases of thoracoplasty, with the necessarily limited experience of any one of his numerous "feeders." It is obvious that the judgment based upon such an experience must acquire a particular value. But the corollary is no less obvious; that the surgeon must himself become somewhat of an internist. He must at least be familiar with the pathology and the general clinical course of the disease; otherwise he remains a carpenter. The age of individualization is past, and this generation is witnessing an extraordinary development of co-operation or teamwork in all branches of human endeavour. The internist and the surgeon must work together for the best results. What the surgeon expects from the internist is a knowledge of what surgery, as a branch of therapeutics, as a tool in his therapeutical armamen-

tarium, can accomplish in selected cases. After this, that part of the internist's contribution to the combined effort is a precise estimate of the patient's resistance as shown by the history of the case and an informed opinion upon the probable course of the disease under eventual continuation of purely medical treatment. The surgeon's contribution is an estimate of the patient's resistance to the operation proposed and of the probable ultimate result of such an operation.

We may now proceed to discuss very briefly the indications for operation. It is to be understood, first of all, that we are concerned only with pulmonary phthisis as seen in late adolescence and the adult. In one word the most favourable type is that of the "good chronic." The incipient and the very advanced cases are obviously out of the question. In one the evidence of resistance has yet to be proved. In the other it has failed. Likewise one must exclude the acute exudative, bronchopneumonic or lobar-pneumonic phthisis, for in these resistance is either overcome or is most uncertain. The chronics, then, who have given proof of defensive powers by the very fact that they are chronics, constitute the greater part of the surgical field. Even the bad chronic, with considerable cavitation, fever, rapid pulse, and showing general symptoms of "slipping," may be accepted, provided he afford the evidence of scar contraction in reasonable degree. What we look for is the contracted chest. That this contraction should be unilateral, that the other lung should be sufficiently sound to carry on the work of respiration after operation has abolished whatever respiratory function the diseased lung is still performing, is a self-evident proposition. What then are the signs of a unilaterally contracted chest? They are sufficiently familiar to all: A falling-in of the rib spaces and of the clavicular fossæ, a pulling up of the diaphragm, a pulling across toward the affected side of trachea, mediastinum and heart, and a narrowing of the intercostal spaces. The pleural space is frequently obliterated by adhesions. Bands of scar tissue traverse the lung and are attached at one side to an unyielding bony thorax, and on other sides of the periphery, to a thickened pleura and mediastinum. By these cavities are held open. There is everywhere the evidence of tension. Scar has contracted to its limit. There is no help to be seen save in the further yielding of some structure. The opposite healthy lung has yielded as far as possible and become emphysematous. The diseased lung, the trachea, mediastinum, heart and diaphragm have come across as far as they can. Even the ribs have given as far as possible. But the chief blame still falls on them. They are the innocent guilty. If they cannot yield further, their good will must not be counted to them as a saving grace. It is obvious that they must be cut off and their generation know them no more. Metaphor aside, such is the *raison d'être* of the operation. That being done, relief of tension is afforded. It is an "entspannung" in a very real sense. To this release there is added an actual compression of the lung substance through the falling in of the rib stumps, and, what is of still greater importance, the lung is put at rest. The walls of cavities are brought together, or at any rate closer together; minute cavities are obliterated; the blood circulation is altered, though in which direction we are not quite sure; the lymph circulation is certainly slowed; the air circulation is reduced; the absorption of toxins is retarded or prevented; the fibrosis of hyperæmia and of air emptiness is encouraged, and, in short, nature takes a fresh grip and is given a chance to proceed with her ordinary work of scar formation.

We may turn now to a short consideration of the pathological changes that develop in the compressed lung after the operation of thoracoplasty or after the institution of a complete pneumothorax. One's hope, of course, is that the sclerosing process of low-grade inflammation, which was in evidence before operation, will continue; and, as a matter of fact, the end-result in the favourable case is a small, solid, fibroid lung, like a spleen. But it is interesting to inquire by what particular new agencies this result is brought about, and in what way extension of the disease is prevented. Fibrosis in the lung before operation is certainly due to chronic, low-grade inflammation, the response on the part of the tissue of the host to the attack of the bacilli. We cannot assume that the attack is immediately stopped by the new condition of lung collapse following operation. And a part of the fibrosis succeeding operation must be ascribed to this factor. But experiment has shown that fibrous tissue is laid down even in the normal lung under certain conditions in which inflammation has nothing to say. And these conditions are, briefly: Air emptiness, venous stagnation and lymph stagnation. Taking the last first, one need only refer to the general thickening of subcutaneous tissue so commonly seen after prolonged use of Bier's

hyperæmia, or as in elephantiasis. That stagnation of lymph takes place in the compressed lung is now generally agreed. Tendeloo and Naegeli both showed that the lymph circulation is largely dependent upon lung movement, and that if this were stopped the lymph-flow was much retarded. Shingu demonstrated that soot, which by way of aspiration had entered the lung tissue, was more slowly worked out of the lung in the compressed than in the uncompressed lung, and this was confirmed by Naegeli, and by Bruns and Kistler; and more recently Gardner has found also a great widening of the lymphatics in microscopic sections. To this feature we ascribe a large share of the lessening of toxaemia observed after lung compression. In experimental work the condition of air emptiness, or atelectasis, has been obtained by permanent ligature of the main bronchus to a lobe. Within twenty-four hours, if the chest be reopened, it is found that the lobe concerned is quite collapsed and apparently solid.* In the course of time a large amount of fibrous tissue is deposited throughout the lobe. The same process has been observed to occur in the human under conditions which cause an obstruction of the main bronchus of a lobe.

The effect of compression of a lung upon the bloodflow through it has been the subject of much inquiry, partly experimental, partly clinical.

Recent work by Giraud and de Reynier, who injected lipiodol into tuberculous lungs long compressed by a total pneumothorax, showed that the lipiodol penetrated more or less freely the bronchial tree and filled even the alveoli to a considerable extent. He argues therefore that, in explaining the good effect of pneumothorax, the older arguments based on cessation of air circulation, compression of alveoli, prevention of dust aspiration, and of a bronchial spread of infection are invalidated, and he falls back upon the theory of changes induced in the vascular and lymphatic circulation. Our observations with lipiodol in old cases of thoracoplasty do not tend to confirm this statement. The alveolar district was not filled, but only cavities and dilated bronchi. But Corper and his co-workers have also shown experimentally that bacilli injected intravenously in rabbits, under the condition of a one-sided total pneumothorax of one month's duration, are deposited about equally in the compressed and the uncompressed lung, and these progress to massive tuberculosis equally on both sides. The arterial circulation, therefore, is not impeded by compression. This contradicts the earlier work of Tiegel, who claimed that in the artificially compressed lung the extension of an experimental tuberculosis did not succeed.

In the presence of these contradictory statements we have to fall back upon the practical observations of pathologically examined lungs that have been subject to compression either from pneumothorax or from thoracoplasty, and such observations have been uniformly to the effect that the chronic compressed lung is hard, firm and atelectatic. We feel sure that no great respiratory exchange goes on in the alveoli of such lungs, even though, perhaps they may be partly filled under the pressure of cough by lipiodol introduced into a main bronchus. We may also feel certain that as in all fibrosed organs the blood circulation is relatively hindered by the very fact of fibrosis, which is apt to obstruct many of the capillaries. And finally the stasis of lymph has been definitely demonstrated in pathological sections. Exactly what part these three factors may play in the ultimate good results of new fibrosis it is difficult to say. All these things probably work together. The main fact remains that operation does in many instances bring about an arrest of the disease through fibrosis.

Returning then to our original conception of the pathology of the lung as concerned with the election of cases for operation, I would put it in this way: If, as the result of consultation with the competent internist and a careful consideration of the clinical course, physical findings and x-ray films (if possible, a complete series of these), it is determined that the chiefly affected lung (very rarely is the disease strictly unilateral) is tending strongly to healing through fibrotic contraction, but is prevented from complete healing by cavitation or by insufficient yielding of surrounding structures, then the operation of thoracoplasty is indicated. Pneumothorax has usually been tried and found impossible or insufficient.* Here we have the uncomplicated picture of the chronic productive form. There are, nevertheless, certain cases of this form that are unsuitable; they are those that show excessive cavitation. Numerous small cavities of the honeycomb type may be excepted; the single large cavity at the apex also. These frequently

*F. A. C. Scrimger: Unpublished experimental work upon massive collapse. Personal communication.

*I reserve pneumothorax for active, exudative disease, either original or complicating a chronic productive process, believing it to be for the pure chronic case both insufficient, ultimately, and not without danger.

heal after a thoracoplasty. But several large cavities in both lobes constitute, in my experience, too big a task. Such patients can be brought safely through the operation, but the ultimate result at best is a degree of improvement which hardly compensates for the suffering endured. These patients are the rather desperate and despairing old chronics of many years' sanitarium residence, who are recognized as only hanging on to life by their teeth. A second class consists of the "chronics" who for several weeks or months have shown signs of activity. These are the mixed forms of productive and exudative lesion. One is sometimes in doubt whether the fever, pulse, sweats, etc., are caused by active exudative tuberculosis or by a mixed infection. Here one is helped by the x-ray picture and by the experience of the tuberculosis specialist. Operation is allowable for either. But if decision leans to the side of tuberculous activity, extra caution is needed to exclude the beginning of active tuberculosis in the good lung. If any such suspicion exists, particularly if any lesion can be demonstrated in the opposite hilus or lower lobe, thoracoplasty should be avoided and every effort made to establish a pneumothorax, or a phrenicotomy alone should be done, because the strain of thoracoplasty is very apt to be followed by rapid exacerbation of the disease in the good lung. Here a pneumothorax, while unsuitable as a permanent form of treatment, is valuable in allaying activity and tiding the patient over into a renewed chronicity with productive tendency, and to a later thoracoplasty. On the continent such cases have been frequently subjected to operation, and sometimes to operation in one stage. Sauerbruch and Brunner recognize freely that they constitute poor operative risks whenever the exudative form holds the upper hand and that good results are most infrequent. I also have operated on a number of patients of this type. But I am sure it is wiser to avoid them or at least postpone them. Operation is a greater strain than phrenicotomy or artificial pneumothorax. Use these for a while; or even trust to Nature, with the help of a bed-rest which must be as absolute as for Pott's disease; and the patient is given, I believe, a better chance than with operation. If he does not improve, he would not do so with operation, and operation may tumble him on the wrong side of the fence.

If all this is true, how much more is it true of the class of acute exudative, progressive tuberculosis coming on fairly early in the disease, even if apparently confined to one side! These show no evidence of fibrosis and scar. I do not operate if trachea and heart are in their normal position. It is fortunate that in this class pleural adhesions are usually absent, and the good effect (often indeed miraculous effect) of lung compression and rest can be more safely secured by artificial pneumothorax. And yet many even of these have been operated on "to give them their chance." The results have been desolating—a high operative mortality, a low percentage of "improvement," and of "practical cures," *nil.* To this attitude I have been led by certain sad experiences, fortunately few. Here, then, lies the main point of this paper: If this operation is to be practised widely in this country I trust that its good name will not be blackened by an excessive mortality due to ignorance of the character of the pathological lesion present in these less favourable types. It is not sufficient that the disease should be apparently unilateral or nearly so. The evidence of resistance in scar contraction must be first demanded. *Do not operate if the trachea is in the midline.*

The Results of Surgical Treatment

In considering the question of results I shall confine myself to a presentation of personal experience set down in tabular form. One must deprecate the drawing of too rigid conclusions in respect of improvements and practical cures; the personal equation varies too much. But as to mortality, here at least figures are not deceiving. And I feel justified in calling attention to the low mortality-rate ascribable to the operative act, calculated for a limit of two months, as adopted arbitrarily by most authors. The operation can no longer be considered a formidable or very hazardous one, provided the cases are selected on the proper basis.

And as to the late mortality, it may be said with confidence that in nearly all cases death has not been hastened by the operation, but is rather due to the progress of the disease, which operation has failed to halt or halted only temporarily.

TABLE I

SUMMARY OF 149 CASES TREATED, DIVIDED AS FOLLOWS:

Total posterior thoracoplasty for uncomplicated unilateral disease	76
Total posterior thoracoplasty plus phrenicotomy	6
Partial posterior thoracoplasty with maintenance of pneumothorax	6
Late secondary thoracoplasty supplementing total posterior thoracoplasty	7
Posterior thoracoplasty, total or partial, followed by apicolysis	6
Total posterior thoracoplasty to replace aseptic pneumothorax	2
Total posterior thoracoplasty with aspiration, to replace pneumothorax with unmixed tuberculous effusion	7
Partial posterior thoracoplasty	5
Preliminary phrenicotomy, followed by partial posterior thoracoplasty	2
Phrenicotomy plus apicolysis	1
Phrenicotomy alone, usually for doubtful risks	11
Open cutting of adhesions to complete a pneumothorax	5
Various operations for pyopneumothorax with severe mixed infection	15
	149

TABLE II—DEATHS WITHIN TWO MONTHS ASCRIBABLE TO THORACOPLASTIC OPERATIONS (EXCLUSIVE OF PYOPNEUMOTHORAX CASES)

Number of Cases		*Time*	*Cases*	*Deaths, Per Cent of Cases*	*Cause of Death*
Total Posterior	104	1st week	2		1. Cardiac failure, 2nd day. 2. Aspiration tbc. pneumonia*, 6th day
Partial Posterior	13	2nd week	5		1. Tbc. pneumonia. 2. Infected wound and secondary hæmorrhage. 3. Paradoxical respiration and cardiac failure. 4. Acute pneumothorax on good side. 5. Cardiac failure and paradoxical respiration.
		3rd week	1		1. Streptococcus sepsis.
		7th week	1		1. Tbc. pneumonia.
Total	117		9	7.7%	* following preliminary phrenicotomy.

In 6 of these 65 an apicolysis was done at intervals of six weeks to two and one-half years after the posterior thoracoplasty. Of these 3 patients died within two weeks. All 3 had very advanced cavitation with fibrosis throughout the lung and were in desperate condition. The operation of apicolysis in such cases should be avoided. These deaths are not included in this table, which includes only the standard operation. They properly come under "deaths from progress of disease."

TABLE III

LATE DEATHS NOT ASCRIBABLE TO OPERATION OF POSTERIOR THORACOPLASTY (EXCLUSIVE OF PYOPNEUMOTHORAX CASES WITH MIXED INFECTION)

In 7th week (from typhoid contracted in hospital after good recovery from two-stage thoracoplasty	1
During 1st year (from progress of disease)	5
During 2nd year (from progress of disease)	6
During 3rd year (from progress of disease)	1
During 5th and 6th years (from progress of disease)	2
	15
During first two weeks after apicolysis, a third operation following the two-stage thoracoplasty	3
	18

Total number of deaths.....18
Total number of cases, 117 (15.4%)

TABLE IV—GENERAL RESULTS FOLLOWING THE OPERATION OF THORACOPLASTY, TOTAL, PARTIAL, OR WITH ADDED APICOLYSIS

Operation over 1 year ago..... 88 cases			Operation in past year..... 29 cases		
Practical cures	29	(33%)	Greatly improved	12	(41.4%)
Greatly improved	28	(32%)	Improved	6	(20.7%)
Improved	7	(8%)	Stationary or worse	1	(3.4%)
Deaths due to operation	6	(6.8%)	Deaths due to operation	3	(10.3%)
Deaths due to progress of disease (one to intercurrent typhoid)	17	(19.3%)	Deaths due to progress of disease	1	
			Still in hospital	6	

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TUBERCULOUS EMPYEMA

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TUBERCULOUS empyema strictly speaking is that form of empyema in which pus, containing only tubercle bacilli, is found in the pleural sac. In this paper that form in which a secondarily infecting organism is present is also included.

Tuberculous involvement of the pleura may be broadly classified into: (1) primary, and (2) secondary forms. The first is that form in which an infection of the pleura occurs in the absence of any demonstrable lesion in adjacent organs; the second is that form in which the pleura becomes involved by extension from an adjacent focus. The primary focus is usually to be found in the lung, but a secondary purulent pleurisy may also occur from an extension of a tuberculous osteomyelitis of a rib or a tuberculous spondylitis.[1]

There is much evidence to show that all primary pleurisies are tuberculous in origin. Hodenpyl found nodules and patches on the visceral pleura in 44 of 91 cases in which the lungs were free from tuberculosis.[3] In a series of cases of primary pleurisy with effusion followed for 5 to 20 years, 35 to 55 per cent eventually died of tuberculosis (Osler, Hedges, Sears and others).[5] In Koester's series of 514 cases, 245 became tuberculous.

Involvement of the pleura is frequent if not invariable in pulmonary tuberculosis. Where the involvement is gradual, as at the apex, adhesion of the two pleuræ usually results, thus preventing a general involvement of the pleural cavity. In the absence of obliterating adhesions the pleural cavity may become grossly infected by the rupture of a subpleural focus, producing a spontaneous pneumothorax. This occurs in from 4 to 10 per cent of institutional cases of tuberculosis.[5] The occurrence of a serofibrinous effusion in cases of tuberculosis being treated by pneumothorax is very frequent. A certain number of these serofibrinous effusions pass insensibly into purulent exudates. The occurrence of a spontaneous pneumothorax may be responsible for the purulent change. The lung may be torn by bands of adhesions in the introduction of the air. Peters reported the occurrence of twenty-six cases of purulent effusion in 250 cases of artificial pneumothorax.[10] The fluid in eight of these showed mixed infections, the remaining 18 proved negative on culture.

Parfitt and Crombie reported a series of 63 patients, in 16 of whom (25 per cent) sterile pleural effusions developed. Five of these were present at the time of the initial operation; eleven developed during the course of treatment; two purulent tuberculous and one secondarily infected tuberculous empyema died during the course of treatment.[11] Dr. Parfitt states that since May 1918, when this analysis was made, 105 cases have been treated:

Fluid replacements 5
Attempted pneumothorax which was abandoned 19
Of the 81 in which a more or less satisfactory compression was obtained:
28 had no pleural complication.
34 had serous effusion.
18 had an effusion that became purulent, but not pyogenic.
1 had a pyogenic infection from rupture of a pulmonary abscess.[12]

A certain small percentage of acute empyemata are tuberculous in origin. Wilensky reported 297 cases of acute empyema, only 2 per cent of which were caused by the tubercle bacillus, and in a second series of 574 cases an incidence of about 2 per cent only was found.[4] The occurrence of a negative culture in a case of empyema should always suggest that the condition may be tuberculous. A history of the condition having begun as a pleurisy, and still further of repeated attacks of pleurisy at earlier dates, should always make one suspect tuberculosis.

The demonstration of the tuberculous nature of a pleural effusion or exudate is often difficult,

although clinically one may feel fairly certain of its nature. A high lymphocytic content suggests tuberculosis but on the other hand a high polymorphonuclear count may be found. Sanguineous effusions are usually tuberculous or malignant. Direct smear is stated to be comparable to examinations of the sputum and positive in 20 per cent of cases. The results of animal inoculations vary from 22.7 to 84.5 per cent positives, probably depending upon the amount of fluid used.[5] The inoscopic examination of Yousset or the sedimentation method of Zebrouski may be used. Pathological examinations of sections of pleura may be done only in case of surgical intervention. It is not infrequent that only one of several such sections may demonstrate the tuberculous nature of the process.

The outlook in tuberculous empyema is always extremely grave. Jehn reported in 1923 having treated about 100 cases of tuberculous empyema, with some mixed infections, occurring as a complication of artificial pneumothorax. About 90 per cent of them died; only about 10 were in good enough condition to permit aspirations, closed or open drainage, or thoracoplasty; all of these had been considered as "practically cured."[2] Of another series of 12 patients, with sterile exudates, reported by Osler and McCrae, only one of whom showed tubercle bacilli in the sputum, 3 died in hospital. Of the remaining 9 patients, 6 have been traced. All have died except one who had a discharging sinus seven years after operation, but was otherwise well. Kalb reports 12 cases of tuberculous empyema.[7] Two treated by thoracotomy died; 7 treated by Murphy's method were improved and relieved of their complications. Murphy's treatment, as used by Kalb, consisted of aspirations of as much pus as obtainable and replacement of 1 to 12 oz. of 2 per cent of formaldehyde in glycerin, never more than half the volume of pus aspirated. The procedure was repeated every 3 to 10 days until the exudate became sero-sanguineous. Parfitt treats persistent turbid pleural fluids by injection of 5 to 10 grains of methylene blue every 7 to 10 days and claims satisfactory results.[12] In Hedblom's series of 23 cases definitely proved to be tuberculous, 61 per cent were cured, or greatly improved; 39 per cent died. The post-operative mortality was 21.7 per cent.[5] Pinchin and Cartledge report a single case of sterile purulent pleurisy which recovered, following several aspirations and on one occasion injections of thymol, camphor, and sulphuric ether.[8] The attitude of several writers would seem to be that the outlook in secondarily infected tuberculous empyema is practically hopeless.

From the standpoint of treatment, cases of tuberculous empyema may be divided into (1) tuberculous empyema in a closed cavity without secondary infection; (2) tuberculous empyema in a closed cavity with secondary infection; (3) tuberculous empyema complicated by the presence of a bronchial fistula or a chest wall sinus, or both. The former are frequently secondarily infected with pyogenic organisms, the latter always.

Sterile purulent pleural exudates in a closed cavity should be treated as pleural effusions if the lung expands when fluid is withdrawn. If the lung is fixed in collapse, an extrapleural thoracoplasty should be done forthwith. Lemon gives five indications for the removal of fluid: (1) for diagnosis; (2) for relief; (3) when the chest contains so much fluid as to cause mediastinal dislocation; (4) when the fluid fails to be absorbed after a sufficient interval, part may be removed; 5) when fluid is located bilaterally.[4] The aspiration of presumably or proved tuberculous fluid should not be undertaken lightly. The chest wall should be prepared as for a surgical operation; the needle should not be touched with the hands and should be introduced through a nick in the skin, made with a scalpel, to avoid carrying a piece of infected skin into the chest. Local novocaine anæsthesia should always be used.

S. aureus is the common organism found as a secondary infection in tuberculous empyema. So common is this that the finding of the staphylococcus in an empyema in itself suggests that the condition may be primarily tuberculous. Too much fluid should not be withdrawn because of danger of the rupture of a subpleural abscess when the support is removed from the surface of the lung. While it is true that if a tuberculous exudate is secondarily infected by the rupture of a subpleural abscess and the establishment of a bronchial fistula, the secondarily infecting organism is likely to be a staphylococcus, the history of several of our

cases strongly suggested that the infection might have been carried in by an aspirating needle. If tuberculous pus fails to be absorbed after a reasonable period has elapsed, a small amount may be removed by aspiration in the hope of hastening the absorptive process. It has been found by experience that this actually does occur.

It may be that, because of active disease in the underlying lung, it is not advisable that it should be allowed to expand. In this case one has the choice of substituting air for the pus and maintaining an artificial pneumothorax, or proceeding with an extrapleural thoracoplasty. Repeated aspirations may result in secondary infections. Purulent exudates of long standing are apt to be complicated by the occurrence of a bronchial fistula or an empyema necessitatis. It is unlikely that a functioning lung can be hoped for often and it would seem wiser, therefore, to proceed without further delay to an extrapleural thoracoplasty. Under no circumstances should open drainage be established. If this be done, secondary infection, the greatest possible catastrophe is certain to occur. Pleural exudates which have shown no organism on direct smear, and have proved negative on culture, should never be drained until it has been proved beyond question of doubt, that they are not tuberculous. It is true that the organism responsible, particularly if the pneumococcus, may have died out, but it is also quite likely that the exudate may be tuberculous.

In the event of a bronchial fistula occurring in the course of treatment of a tuberculous pleural effusion or tuberculous empyema, secondary infection does not necessarily always occur at once. No such case of tuberculous empyema has come under our care, but in one case of tuberculous effusion, there was a large hydropneumothorax and the patient could, by bending forward with the head low, drain large amounts of clear fluid from his chest. This patient was promptly treated by a wide extrapleural thoracoplasty. The cavity was completely obliterated, and no secondary infection of the fluid occurred. It would seem to us that when this complication occurs and the previously existing fluid, whether serofibrinous or purulent, does not at once become secondarily infected, a sufficiently wide extrapleural thoracoplasty should be proceeded with without delay. There may be a possibility of a spontaneous closure of the fistula, but the danger of secondary infection of a wide tuberculous cavity is too great to justify procrastination.

Should a secondary infection of a tuberculous effusion or exudate occur, whether from rupture of a subpleural abscess, the formation of a bronchial fistula, the occurrence of empyema necessitatis, or by way of the aspirating needle, a grave problem is presented. Such cases should be drained efficiently at once, either by a closed intercostal drainage or rib resection and open drainage. Closed drainage has the advantage that the cavity may be reduced in size, thus limiting the extent of the subsequent extrapleural thoracoplasty which probably will be necessary. Irrigations of the cavity with antiseptic solutions in the hope of destroying the secondarily infecting organisms is suggested, but the use of irritating fluids and especially of Dakin's solution is contraindicated. The hypochlorite solution has been shown to have little or no action on the tubercle bacillus but because of its corroding action on the exposed diseased area of the parenchyma of the lung, there is a tendency to the formation of bronchial fistula and to hæmorrhage. The value of irrigation is doubtful.[5]

When an open drainage has been established and a copious purulent discharge is occurring, the patient running a febrile course, and losing instead of gaining ground, a multiple stage extrapleural operation should be proceeded with at once. The patient probably will stand well short operations of limited extent, done preferably under local anæsthesia, but if necessary, under gas and oxygen, and will show a steady improvement as the size of the cavity decreases and consequently the amount of discharge. Case 2 illustrates well what may be accomplished under such circumstances. Should drainage appear to have relieved the toxicity and the patient continue to show improvement, any collapsing operation should be deferred until the cavity has been reduced as much as possible, and one has satisfied himself that spontaneous closure will not occur. The cavity may be reduced to such an extent that a comparatively limited operation only will be necessary (Case 6).

Several of our cases have come to us as cases

of chronic empyema which failed to close and were subsequently proved to be tuberculous. In most cases the drainage was inefficient. Where a small discharging sinus existed with a large empyema behind it, a rubber catheter which completely filled the opening has been inserted and a suction drainage established. When as much as possible has been accomplished in this way, as shown by no further decrease in size of the cavity, an extrapleural thoracoplasty is proceeded with, the part away from the sinus being first dealt with in order that no infection of the large operation wound may occur. The ribs in the neighbourhood of the sinus are resected last, and at the same time a proper wide dependent drainage established. Where it is not possible to establish closed drainage in this way, wide dependent drainage is first established, followed by irrigation until no further improvement occurs, and finally a collapsing operation is performed. In this way it is possible to reduce the size of the cavity to one of comparatively small extent, to convert a profuse daily discharge to a slight soiling of the dressing, and to restore the patient to comparatively good health.

Where the cavity is suitably situated and has been reduced with or without thoracoplasty, to a shallow thin recess which still fails to heal, the overlying ribs, intercostal muscles and thickened parietal pleura are completely removed and the resulting furrow packed widely open with paraffined iodoform gauze. The operation is on the same principle as the so-called "saucerizing" operations for bone cavities. Subsequently, the packing is removed daily and the surface of the wound exposed to quartz light; wherever possible, exposure of the cavity and whole body surface to sunlight is carried out. The smaller furrows will granulate in and close without further interference; the large ones may be closed subsequently with a pedicle skin graft (Cases 4 and 5).

Case 1

No. 65136, J. T., age 26 years. Admitted September 9, 1925. Discharged January 13, 1926.

History.—Three years ago was apparently perfectly well. About this time he developed left sided pleurisy. The pain disappeared in one month and was followed by cough and profuse expectoration. Five months after onset of pain, he had two profuse hæmoptyses. Has been in sanitarium since March, 1923. In July of that year he developed spontaneous pneumothorax. Discharged from sanitarium four months ago as an arrested case. Felt well for three months, when he had a recurrence of left-sided pain, developed a splash in the chest, had profuse sputum and by leaning over could drain a quantity of clear fluid from the mouth.

Examination on admission.—Fairly well developed and nourished. Had a complete hydropneumothorax on the left side with displacement of the mediastinum to the right. Other lung free of disease.

Pathological findings.—Sputum negative for tubercle bacilli. Pleural fluid clear and sterile on ordinary culture; later, it became purulent, but was sterile on ordinary culture and showed tubercle bacilli on smear.

Treatment.—September 25, 1925, phrenicotomy; October 3rd, posterior resections of 11th to 6th rib

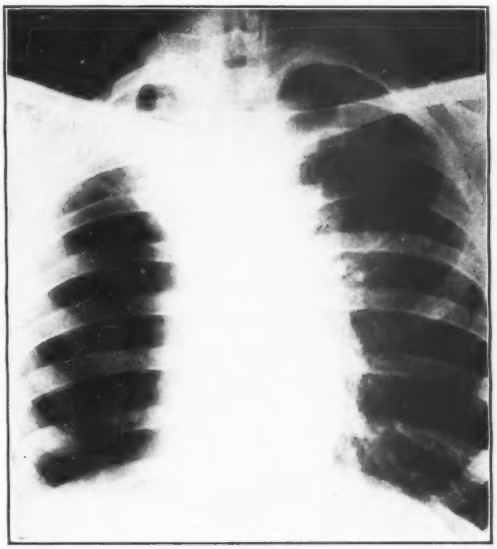

Fig. 1.—*Case 1.*—J. T. Large hydro-pneumothorax with bronchial fistula.

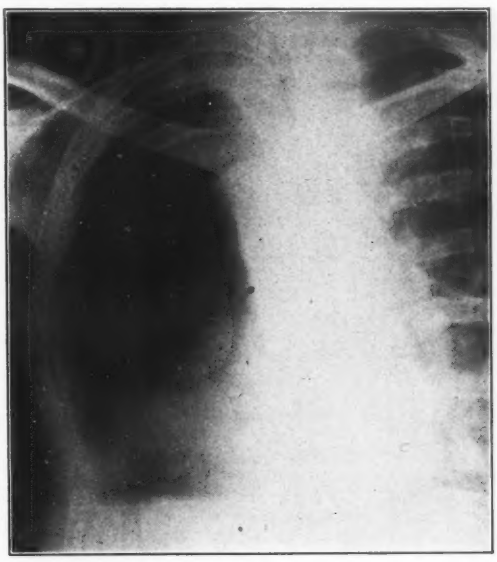

Fig. 2.—*Case 1.*—J. T. Showing appearance after resection of the 11th to 6th ribs, inclusive from the transverse processes of the vertebræ forward.

inclusive; October 11th, posterior resection of upper five ribs; October 31st, axillary incision. Resection of 2nd to 9th ribs from posterior section to the costo-chondral junctions, ninety-four inches of rib were removed in all; Nov. 25, 1925, aspiration of 200 c.c. of yellowish fluid which had failed to absorb; December 15, 1925—attempted aspiration but no fluid present.

Result.—Discharged afebrile, gaining weight and in excellent general health. Has remained well. See Figs. 1, 2 and 3.

Case 2

No. 63507, P. D., age 38. Admitted February 23, 1925. Discharged November 20, 1925.

History.—Four years ago had a poor recovery after childbirth. Two and one-half years ago developed a cough. Two years ago the condition was diagnosed as pulmonary tuberculosis and she was sent to sanitarium, where the condition was treated by the establishment of pneumothorax. Eight months ago fluid formed in chest. Pneumothorax continued with gain in weight and general well being. Allowed up. Two weeks ago a sudden spontaneous pneumothorax occurred followed two days later by rise in temperature. February 21st, pus aspirated and Gram positive cocci found on direct smear.

Examination on admission.—Very ill. Fever 102° to 104.° Right pyopneumothorax with empyema necessitatis beneath right breast and beginning one in posterior axillary line in 9th interspace.

Pathological findings.—Sputum negative for tubercle bacilli. Section of parietal pleura removed at operation,

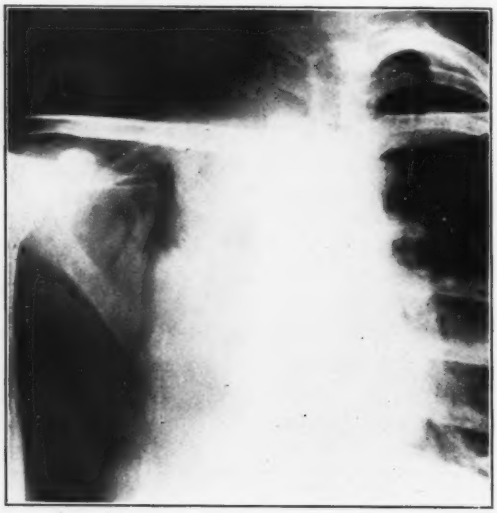

Fig. 3.—*Case 1.*—J. T. Showing appearance after resection of the ribs from the transverse processes of the vertebræ to the costo-chondral junctions. The cavity has been completely obliterated.

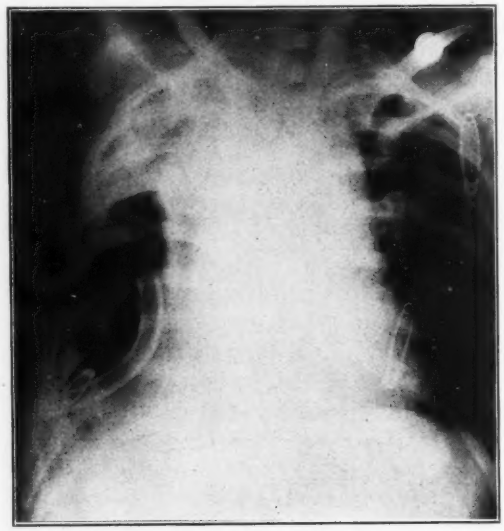

Fig. 5.—*Case 2.*—P. D. Appearance following dependent drainage.

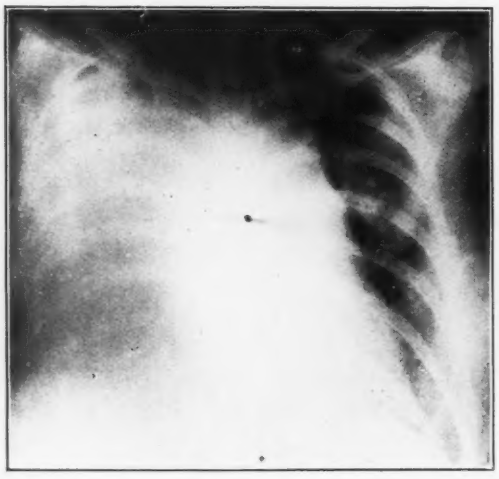

Fig. 4.—*Case 2.*—P. D. Original plate showing right side of chest full of pus and displacement of the mediastinum to the left.

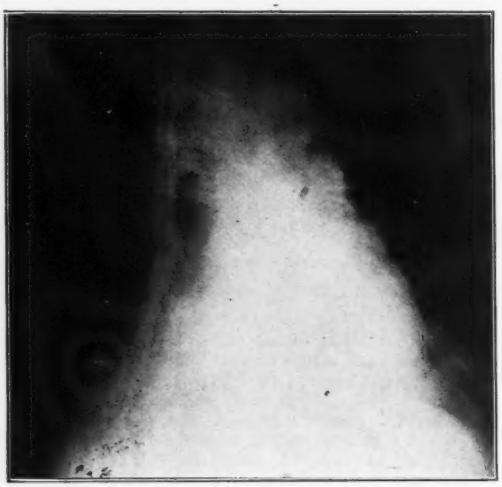

Fig. 6.—*Case 2.*—P. D. Final result after resection of the ribs from the transverse processes to the costo-chondral junctions.

diagnosed tuberculous. Secondary infecting organism *S. aureus.*

Treatment.—February 23, 1925, drainage of subpectoral abscess under local anæsthesia. March 24th, rib resection at area of pointing posteriorly, with insertion of large tube. Profuse daily discharge. No evidence of improvement or decrease in the amount of daily discharge. From June 16th to August 25th, a complete collapse of the right chest wall was obtained by extrapleural thoracoplasty in six stages. October 3rd, right phrenicotomy. During the course of the operations the temperature fell gradually and weight increased steadily.

Result.—Temperature normal for six weeks before discharge. Was gaining in weight and appetite. Just enough discharge from wound to moisten dressing daily. When seen one and one-half years later, her weight was normal, and she was doing the housework for a family of three. The opposite lung, which had shown a good deal of cloudiness, had completely cleared. The amount of discharge was the same. See Figs. 4, 5 and 6.

Case 3

No. 65133, G. J., age 34. Admitted January 8, 1926. Discharged April 23, 1926.

History.—In May, 1923, he developed right sided pleurisy, was in bed three weeks and about home for the following six weeks with a severe cough. July, 1923, rib resection done; tube left in for two and a half to three months. A sinus had persisted and he had never felt well since. Weight had dropped from 195 to 140 lbs. Repeated examinations of the sputum had been negative for tubercle bacilli.

Examination on admission.—Thin and ill looking. Temperature 101.° Right chest markedly flattened and immobile above, expanded below. Pyopneumothorax with large amount of pus in right chest. Mediastinum displaced to the left. Discharging sinus in mid-axillary line which required dressing every four hours; fingers clubbed; chronic cough.

Pathological findings.—Sputum negative for tubercle bacilli. No tubercle bacilli found in pus from the chest. Sections of the parietal pleura diagnosed tuberculous.

Treatment.—Rubber catheter which just filled the sinus inserted and suction drainage established; 100 oz. of thick, foul smelling pus evacuated in first twenty-four hours. January 12, 1926, 8th, 9th, 10 and 11th ribs removed from the transverse processes of the vertebræ to the costo-chondral junctions. January 20th, posterior sections of 4th, 5th, 6th and 7th ribs removed. February 10th, posterior sections of 1st, 2nd and 3rd ribs removed. February 23rd, 3rd, 4th, 5th and 6th ribs removed from the point of section posteriorly to the costo-chondral junctions, through an axillary incision. March 6th, free drainage established at the lowest point of the empyema cavity. March 20th, phrenicotomy.

Result.—On discharge, the temperature was normal, and appetite good. There was enough daily discharge to moisten dressing.

The patient was re-admitted to hospital in May, 1927, in the hope that the cavity might be completely obliterated by laying it wide open as described above. The general health was good, weight 180 lbs. The cavity was explored but was found to extend too high to obliterate as planned and it was evident that a small amount of permanent drainage would remain.

Case 4

No. ..... M. B., age 38 years. Admitted October 2, 1925. Discharged, April 1, 1927.

History.—Left sided pleurisy began January, 1923. Two and a half months later was admitted to hospital and the chest drained. Was in hospital until six months ago and during the latter part of this period several ill-planned attempts were made at thoracoplasty. Had spent the last six months in a sanitarium.

Examination on admission.—Ill and emaciated. Temperature 104° to 105.° Retraction of left chest. Several irregularly placed scars over the lower part of the posterior aspect of the chest with multiple discharging sinuses. Liver 2 inches below the costal margin; spleen palpable; fingers clubbed; x-ray showed a localized pyopneumothorax, overlying which were irregularly placed interlacing masses of new bone which had formed following the former inefficient attempts at thoracoplasty.

Pathological findings.—Sputum negative for tubercle bacilli. The pus from the sinuses showed *S. aureus.* Sections of the parietal pleura were diagnosed tuberculous.

Treatment.—October 24, 1925, thorough drainage of the infected soft tissues established by wide incision joining all the sinuses and the wound packed widely open. January 19, 1926, thorough dependent drainage of the cavity established by resecting portions of the 6th, 7th and 8th ribs at the lowest and most anterior part of the cavity. Following this a complete multiple stage extrapleural collapse of the chest was done by resecting all the ribs from the transverse processes of the vertebræ to the costo-chondral junctions. The remaining cavity was opened up as described and packed widely open. The surface of the cavity was exposed to quartz light and sunlight. From October 23, 1926 to November 9th, a pedicle skin graft was done to close in the remaining area.

Result.—On discharge the general health was good. There were two or three shallow tuberculous ulcers not more than 1 cm. in diameter and a sinus in the axilla about 2 inches deep and just large enough to admit a probe. It is felt that these may entirely heal with a summer in the sunshine.

Case 5

No. ..... M. B., age 32 years. Admitted April 27, 1926, and is still in hospital.

History.—Three weeks before admission had hot and cold flushes and general aches followed in three days by pleuritic pain on the right side. Slight cough. No sputum.

Examination on admission.—Dullness and limitation of movement of the lower right chest. Marked displacement of the mediastinum to the left. Diagnosis of pleurisy with effusion made. Fluid aspirated on May 5th and May 12th was purulent, but contained lymphocytes only. On May 12th, 1,580 c.c. were aspirated. X-ray suggested a localized empyema medial to the general cavity.

Pathological findings.—Sputum negative for tubercle bacilli. Pleural fluid negative on smear and sterile on culture. Guinea pig inoculations of fluid negative. Sections from the parietal pleura diagnosed tuberculous.

Treatment.—May 19, 1926, 5th and 6th ribs resected in the mid-axillary line. Localized area of considerable size in pleural cavity opened into, which contained only a turbid fluid. Opening of indurated area anterior to incision delayed and wound packed in hope of getting a localization. May 26th, thorough exploration with needle yielded no pus; drainage established. June 18th, 750 c.c. of clear fluid withdrawn from left base. Sufficient time was allowed to elapse for the cavity to decrease in size as much as possible. September 18th, 5th, 6th, 7th and 8th ribs widely resected over the cavity along with the intercostal muscles and parietal pleura and the resulting furrow packed widely open. Daily exposure to quartz light. From November 9, 1926, to December 10th, pedicle skin graft applied to remaining unhealed area. March 9, 1927, area resulting from slough of tip of graft closed by plastic work.

Result.—Area is practically healed. General health excellent.

Case 6

E. C., age 22. Admitted April 23, 1925. Discharged May 20, 1925.

History.—March 14, 1925, developed scarlet fever. Two weeks later developed pleurisy on the right side and on April 18th was found to have a chest full of fluid. April 18th to 29th repeated aspirations; as much as 1,850 c.c. of pus were removed at one sitting.

Examination on transfer to surgical service, April 29th.—Thin, very ill. Large right pyopneumothorax. Temperature 103° to 104.° No evident bronchial fistula.

FIG. 7.—*Case 6.*—E. C. Original plate. Large pyo-thorax.

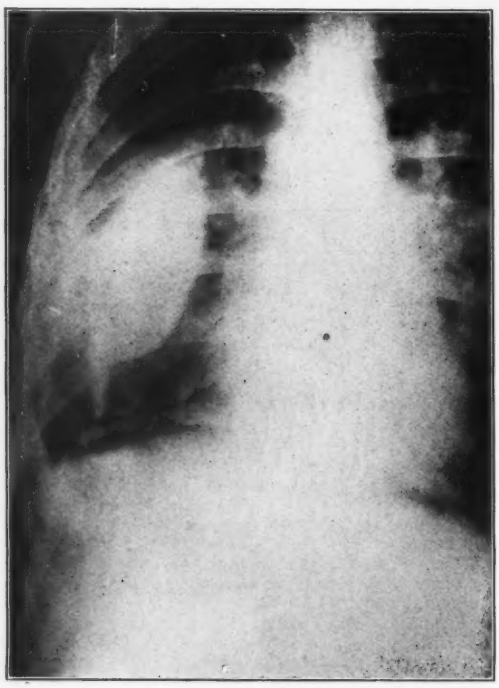

FIG. 8.—*Case 6.*—E. C. Persistent cavity injected with iodoform and paraffin.

Pathological findings. — Pus contained hæmolytic streptococci. No tubercle bacilli demonstrated. Sputum negative for tubercle bacilli. Section of pleura later diagnosed tuberculous.

Treatment.—Resection of the 8th rib in posterior axillary line under local anæsthesia. Open drainage. Allowed to go home at her own request on May 20, 1925, with tube in chest still discharging. June 9th re-admitted with persistent sinus. X-rays of injected sinus showed shallow cavity of limited extent beneath posterior chest wall. July 11th, portions of five ribs overlying shallow cavity resected along with the intercostal muscle and parietal pleura. Cavity packed open with iodoform gauze. September 3rd, allowed home at own request with small unhealed cavity.

January 14, 1926, re-admitted with very small unhealed sinus, necessitating change of dressing once a week. January 19th, tract excised along with portions of infected ribs which were apparently keeping up the discharge. This is the only case in the series in which an osteomyelitis of the cut ends of the ribs developed and resulted in a persistent discharge.

February 1st, discharged with wound almost healed.

Result.—The patient has changed her address, and therefore whether or not the wound has healed cannot be definitely stated. See Figs. 7, 8 and 9.

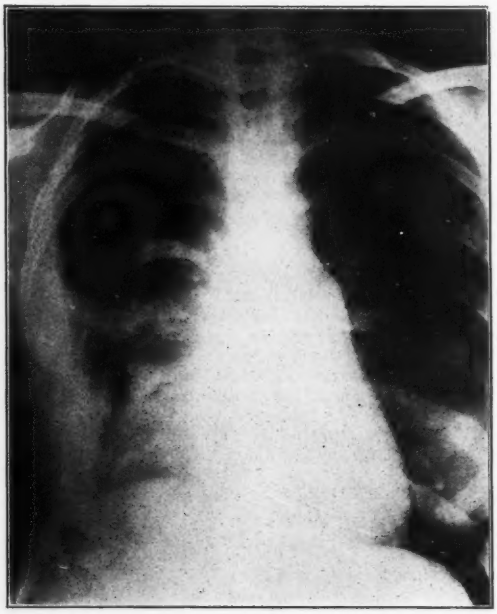

FIG. 9.—*Case 6.*—E. C. Showing the manner in which the shallow posterior cavity was obliterated by a local resection of ribs.

SUMMARY

Tuberculous involvement of the pleura may be primary or secondary.

2. There is much evidence to show that all primary pleurisies are tuberculous.

3. The occurrence of a purulent pleurisy in cases of pulmonary tuberculosis being treated by pneumothorax is not infrequent. A definite

percentage of these become secondarily infected.

4. The definite bacteriological or pathological proof of the tuberculous nature of an empyema is difficult.

5. Sterile empyemata should never be treated by drainage until it has been proved beyond doubt that they are not tuberculous.

6. From the standpoint of treatment, tuberculous empyemata may be divided into tuberculous empyema in a closed cavity without secondary infection, tuberculous empyema in a closed cavity with secondary infection, and tuberculous empyema complicated by the presence of a bronchial fistula or chest wall sinus.

7. Sterile empyema in a closed cavity may be treated for a time as tuberculous pleurisy.

8. If absorption fails to occur or if expansion of the underlying lung is not desired, extrapleural thoracoplasty is indicated.

9. If a bronchial fistula occurs and secondary infection is not immediate, an extrapleural thoracoplasty should be done.

10. Secondarily infected tuberculous empyema in a closed cavity should be treated by closed or open drainage.

11. Large cavities may be greatly reduced in size or entirely obliterated by wide extrapleural thoracoplasties.

12. Shallow cavities which fail to heal may be treated, if suitably situated, by wide exposure, quartz light and heliotherapy and, if necessary, subsequently covered by pedicle skin grafts.

In conclusion, I should like to thank Dr. N. S. Shenstone to whom I am indebted for the privilege of reporting these cases, who has operated upon the majority of them, and who has permitted me to operate upon the remainder.

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INFECTIONS OF THE HAND

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THE object of this paper is to outline the treatment of certain infections of the hand which, in the opinion of the author, are most advantageously treated without the use of wet dressings. The objections to routine wet dressings are too well recognized to make necessary the mention of more than one of the end-results of their prolonged use, namely, the wet, "soggy", œdematous hand.

It should be recognized that for the intelligent carrying out of any (and particularly of this) method of treatment, certain things are necessary. Among the more important requirements are: an accurate and practical knowledge of the anatomy of the hand; a definite understanding of the manner in which infection tends to spread in the hand;* a correct diagnosis of the exact site of infection; a knowledge of the principles on which the treatment is based; and a correct and adequate incision.

THE INCISION

The importance of correct incisions in dealing with infections of the hand cannot be too strongly emphasized. Various principles have been laid down by different surgeons. An attempt has been made to embody these in the following rules. Certain of these would at first sight appear to simply state the same idea

* For a complete discussion of this subject one cannot do better than mention the work of Kanavel,[1] and particularly his experimental injection of the tendon sheaths and fascial spaces.

in a different manner; while this is to some extent true, they are worthy of detailed study, as they have in certain cases an individual application.

The incision must be adequate; the main object of incising any infected area is to relieve tension and not to drain pus. Generally speaking it is bad policy to make longitudinal incisions on either flexor or extensor surfaces. Incisions should correspond more or less with the natural flexion creases of the hand. Incisions should not cross the flexion creases at right angles. Pressure bearing surfaces should be avoided when possible. Incisions must not destroy nerve supply (sensory or motor) and should not needlessly interfere with blood supply.

Certain incisions formerly used, and indeed still given in many text-books on surgery, may be mentioned only to be condemned. Of these, two are especially deserving of censure. They are: the antero-lateral finger incision for teno-synovitis; and the old median longitudinal incision for teno-synovitis and palmar abscess.

The first of these, the antero-lateral, was introduced as an improvement on the old median incision, but it is very doubtful if it has any advantage. While it does prevent prolapse of the flexor tendons, it very frequently destroys the sensory nerves to the finger. It is most unfortunate that so many text-books on anatomy describe these nerves as occupying a position *midway* between the anterior and posterior surfaces of the finger. In reality they are found much nearer the anterior than the posterior surface. In this position they are particularly liable to injury when the antero-lateral incision is used. The serious disability resulting from a finger devoid of its sensory supply is well recognized.

The old median incision for teno-synovitis is still in use by many surgeons, incredible though it may seem. When we consider the almost invariably disastrous results of its use, no apology is necessary for the repetition of a few of its disadvantages. It transgresses nearly every one of the principles laid down for correct incisions. It nearly always leads to prolapse of the tendon. The cases that eventually heal have a scar on a pressure bearing surface, which frequently remains tender and always interferes with flexion and extension. A stiff finger in a position of partial flexion is usually the best result obtained. When the incision is prolonged into the palm, a position of almost complete flexion is a common result.

It should be remembered that flexion of the fingers from contracture may result from longitudinal incision of the palm for deep palmar abscess, even in cases where the tendon sheath of the finger is not involved. A dissection of the palm (Fig. 1) shows how this may occur.

FIG. 1.—Dissection of the palmar fascia showing tendency of fascial fibres to bunch in longitudinal incision.

The skin has been reflected, exposing the deep palmar fascia. A longitudinal incision has been made in the fascia on a line between the middle and ring fingers. The edges have been retracted as they would be by the insertion of a drain. A definite bunching up of the fibres of the palmar fascia may be seen at the sides of the incision. It needs little imagination to realize the finger flexion which may occur from the contraction of such a band of fibrous tissue in the subsequent scar formation. This is, of course, of still greater importance in those having even the slightest tendency towards keloid formation. The old median incision certainly most richly merits the term of "the pernicious

median incision'' bestowed on it by Bunnell in his address on ''Plastic Surgery of the Hand'' at Montreal in October, 1926.

The Technique of the Incision

General Anæsthesia is preferable. In whitlow and paronychia local anæsthesia (lateral nerve block with novocaine) *may* be used, but even in these cases better results are obtained with general anæsthesia. Ethyl chloride should never be used.

The operation should have a bloodless field. This is most important. If a tourniquet is not used, many small pockets of pus will be missed: this is especially true in early whitlow. The tourniquet should be removed and any gross hæmorrhage controlled before the final dehydration.

The incision should be a correct and adequate one. It is wise to complete the incision feeling that it has been made a little too big.

All partitions in the cavity should be broken down and all necrotic material removed, using a few layers of gauze over the end of the finger as a curette. Be sure that the wound is completely explored.

The cavity should be dehydrated with alcohol, (rubbing alcohol or methylated spirits).

The cavity should be packed tightly with sterile gauze soaked in liquid paraffin to which a small quantity of B.I.P.P. has been added.

A plain dry sterile gauze dressing should be applied and secured by a bandage and the hand put at rest in the position of function. Splints are applied loosely as a means of securing rest rather than fixation.

After Treatment

Morphia may be necessary for the first twelve hours. After that period it is surprising how comfortable most cases will be. All cases allowed to walk about should have an arm sling and in the severe infections rest in bed is most important. Constitutional measures to favour elimination should not be forgotten.

It is of the utmost importance that these cases should not be dressed too soon. If there is much oozing, the gauze dressing may be removed on the first or second day and a fresh one applied, but the gauze packing must not be removed from the wound itself before the fourth day. If removed too soon, bleeding, with re-infection of the clot is certain to occur. If anything afterwards beyond a very slight oozing occurs one may be sure that the packing has been removed too soon. When removal is carried out at the proper time the bottom of the cavity will be found to be covered with healthy granulations.

The utmost care must be exercised to prevent re-infection of the wound in the carrying out of the dressings. In a discussion of this paper before the American College of Surgeons at Montreal, Dr. Kanavel very strongly emphasized this point and particularly in reference to any secondary infection of streptococcus wounds with staphylococci. No watery solutions should be allowed to come in contact with the wound Only alcohol or liquid paraffin should be used. The ''soaking off'' or softening of the dressing with a watery solution almost always results in secondary infection. If any slough is seen when the packing is removed, the cavity is again dehydrated and once more packed. This time the same attention to tightness is not necessary.

Usually not more than three or four dressings are necessary and often not more than two. If the wound is clean it should be poured full of liquid paraffin and a dry dressing applied. In a few days the edges may be straped together and the wound often heals by primary union. Hot air bakings are very useful and may be begun after the first dressing. Early passive movements should not be neglected in teno-synovitis. Hot baths must not be used until the skin wound is healed, as they always result in secondary infection, if used in the early stages.

The success of this method depends on the well known principle of ''curtain drainage''. The small amount of serum actually exuded reaches the surface along the ''curtain'' of liquid paraffin which forms a thin layer between the gauze packing and the tissues. An objection frequently raised is that there is an apparent contradication in the packing tightly of a wound which has just been incised to relieve tension. To this criticism it is only necessary to say that the area is incised to relieve tension from within. When the wound is packed, pressure is exerted from without and must be applied sufficiently firmly to prevent the accumulation of blood or serum in a dead space where it would result in pus formation.

The following pathological conditions are most efficiently treated by this method:

Simple sub-epithelial infections.
Boils and carbuncles, (on the hand or elsewhere).
Paronychia.
Whitlow.
Suppurative teno-synovitis.
Fascial space infection and especially palmar abscess.

This technique must not be employed in cases in which it is impossible to carry out the principles on which the success of the treatment depends. Particularly is this so in those cases where adequate incision is not possible or may not be desirable. It has been stated by Dr. Fraser Gurd that "the excuse for a wet dressing is an inadequate incision" and all will agree that for certain lesions wet dressings may be the most advantageous. As an extreme example of such cases I may instance boils about the face. In these cases certainly, adequate incisions are neither possible nor desirable and wet dressings are always required.

Special Lesions

Paronychia is one of the most satisfactory conditions to which the above method may be applied. The incision used is that described by Kanavel, namely lateral incisions with the removal of the nail overhanging the area of infection. Fig. 2 shows the incisions which in the author's experience have proved most useful. For whitlow the "horse shoe" or "fish mouth" incision is preferred. By careful palpation with a small probe, previous to anæsthetizing, the involved area may often be localized on one side of the terminal phalanx so that a simple lateral incision will suffice. In cases of doubt however one should not hesitate to make the complete incision. A tourniquet should be applied about the base of the finger. A small puncture is then made over the suspected site. All blood in the finger may now be allowed to escape and the incision leisurely completed in a perfectly clear field. By this method many minute pockets of pus will be found which would easily escape observation in a bloody field. If the periosteum is involved special attention must be paid to its division. The very adequate exposure of the so-called "closed space" on the palmar surface of the distal phalanx is seen in Fig. 3. The dry field method of incision also serves to demonstrate that in nearly all cases some evidence may be found of a puncture wound as the original source of infection. As nearly all of these cases heal by almost primary union, if operated on before too much bony destruction occurs, the old objection of a notched or tender finger tip does not apply.

Fig. 2.—Incisions.

The incision for infection of the hypothenar space is most satisfactory. The same may be said for the drainage of the flexor tendons above the wrist, (Kanavel). This incision is of such value and the space is so easy of access when entered from the ulnar side that one cannot help again emphasizing its efficiency as compared with the old anterior incision, still all too often seen.

The incision for thenar space involvement is not altogether satisfactory. The difficulty is to make it sufficiently large. If carried down too far towards the wrist there is danger of injuring the nerve supply to the thumb muscles. The incision usually given (along the web between the thumb and index finger) has not proved very satisfactory in the hands of the author. There seems to be a strong tendency to adduction contracture of the thumb.

The transverse incision for palmar abscess and the lateral finger incision for suppurative tenosynovitis are best discussed together. The natural tendency, in one unaccustomed to the transverse incision, is a fear of tendon and nerve injury. There is no danger of this occurring if certain simple precautions are observed. A small transverse opening is first made on a line between the fingers, which is deepened until pus is encountered. A director is then passed laterally along the plane of the pus, which will always be found to be superficial to the tendons and nerves if the incision is carried out about one-quarter of an inch proximal to the web, (Fig. 3.) The incision may now be completed in

FIG. 3.—Combined transverse palmar and lateral finger incisions. Note blood vessels and nerves preserved in anterior flap. Complete horse shoe incision of terminal phalanx. Note exposure of "closed space."

safety, using the director as a guide. For complete relief of tension it is frequently necessary to make an incision *at right angles to the first*, dividing the web *at a point midway between the fingers.*

As a guide to the level at which the lateral finger incision should be made, a normal finger should be flexed and its lateral aspect examined. The transverse creases at the interphalangeal joints will be found to terminate at a point

FIG. 4.—Positions of rest (Wood Jones).

posterior to the middle of the lateral aspect of the finger. The incision should be made along a line slightly posterior to this point. If this is done the nerves and blood vessels will be found

FIG. 5.—Position of function.

to be in the anterior flap. It is also of the greatest importance that the incision be carried downwards sufficiently far towards the web so that the incision from the palmar surface (dividing the web) may join it at right angles. Failure to observe these few details may result in injury to the nerves of the fingers. The reason for this will be apparent on study of Fig. 3. In this dissection a combined transverse palmar and lateral finger incision has been made along the lines just mentioned. The blood vessels and nerves may be seen entering the anterior flap.

Prevention of Contractures

More than one writer has stressed the importance of putting the hand at rest. It has even been said to put the hand in the "position of rest." This is sometimes done with rather disastrous results. It should be emphasized that the hand should be placed "at rest in the position of function. Fig. 4 shows the position of rest. The adduction of the thumb and marked finger flexion (especially the outer three fingers)

Fig. 6.—Flat hand. Note adduction deformity of thumb.

should be compared with the most desirable position of "strength," "grasp," or "function" shown in Fig. 5.

Fig. 6 shows the "flat hand," the result of contractures following non-support in the presence of prolonged sepsis. A glance is sufficient to emphasize the several serious disabilities it represents. The adducted thumb, hyperextended fingers and palmar flexion of the wrist are all avoidable by early attention to maintenance of the true functional position.

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HYPERKERATOSIS OF THE ŒSOPHAGUS

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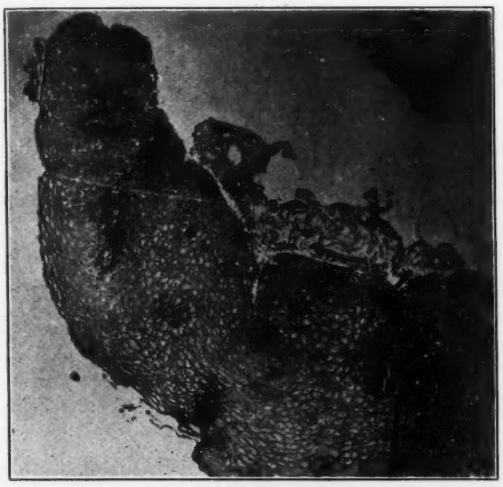
HAD anyone a few years ago suggested to me that patients might suffer from "corns in the œsophagus," I would have thought he was drawing the long bow.

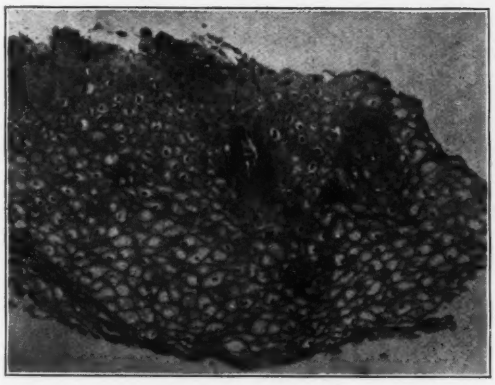
In September, 1924, a female, aged 47, consulted me complaining of difficulty in swallowing, and regurgitation of food immediately after swallowing, the food coming up unchanged. There was great lassitude, and she was tired all the time. Two years previously her weight had been 145 pounds, and at this time she weighed 121¾ pounds. The x-ray showed an almost complete obstruction, only a trace of barium trickling through the lower two inches of the œsophagus. Before condemning her to cancer, I asked Dr. George Biggs to look at it with the œsophagoscope. This revealed near the lower end of the œsophagus a mass resembling in appearance a papilloma. This was snipped off and a small bougie passed through comfortably and easily. The dilatation was continued from month to month for about a year, and she has continued well and regained her weight and strength.

In November, 1925, a female, aged 59, presented herself complaining of a "bubble" coming up in her throat, followed by regurgitation of food at about two or three o'clock in the morning. This symptom had annoyed her for about a year. For the past few weeks however, this regurgitation occurred within half an hour after eating. Though she was still a large woman weighing 205 pounds, she was losing flesh and had weighed 230 a year previously. The x-rays showed a filling defect within the lower inch of the œsophagus. The œsophagoscope revealed a tight non-ulcerating constriction of the lumen, with a non-ulcerating mass projecting

into the lumen. A piece of this was secured for examination. Macroscopically, according to Dr. W. L. Robinson, our pathologist, it appeared to be a small portion of pedunculated tissue, quite soft, measuring 3 cm. in diameter, covered by mucous membrane, with a grayish, slightly pinkish surface. Microscopically, it revealed smooth muscle with surrounding wavy connective tissue, covered by a thick layer of stratified squamous epithelium; the surface showed marked keratinization; the deeper cells were swollen; the basement membrane was intact. An occasional lymphocyte and endothelial cell were seen immediately beneath the mucous membrane. The submucosal tissues were also œdematous. The pathologist made a diagnosis of hyperkeratosis.



Case 3.—Microscopic appearance



Case 3.—Microscopic appearance

The finest bougie with difficulty was "wiggled" through to the stomach, and gradually the passage was dilated. Since then she has, as a matter of safety, had the largest bougie passed about once every three months since, and has continued well. She was thus saved a serious and unnecessary resection of the œsophagus.

In October, 1926, a somewhat complex problem presented itself in the form of a female patient, a diabetic, aged 51, with a hyperplastic adenoma of the thyroid, and suffering from regurgitation of all food taken within a few minutes after it was swallowed. Her regular weight was 140 pounds; she weighed now only 106, having lost a pound a day for ten days previously. As it was impossible to feed her, we gave her glucose intravenously, controlling the sugar by insulin. We then gave her ether as an anæsthetic. It was difficult at first to get anywhere with the œsophagoscope, as it was necessary first to evacuate about half a pint of fluid contents from the field. When clear vision was obtained there was seen at the lower end of the œsophagus a mass very like carcinoma in appearance, but not ulcerating. A snip was taken for section, after which a

Case 1.—X-ray appearance

small bougie could be passed. This was followed by others until the largest œsophagoscope passed readily into the stomach. Bougies are passed from time to time and she continues to improve and gain in weight. The microscopic findings were similar to the previous case.

Case 2.—X-ray appearance

This peculiar series, I felt, should be reported in order that we may not fall down on our prognosis, and what is more important, that we may be able to afford some of the sufferers relief from death by starvation, which of necessity would have been the inevitable result.

It is fairly common in the autopsy room to see a leukoplakia, which is the same thing, at the lower end of the œsophagus, but it never occurred to me that such a condition might cause symptoms. Since these cases have cropped up, though I may never see another, I have often wondered how much such a condition may have to do with some of the cases of intractable œsophageal spasm. I rather think, if such cases were investigated more thoroughly, it would be found that many of them have a non-obstructing leukoplakia within the lower two inches of the terminal œsophagus.

Case 3.—X-ray appearance

In all three cases these patients were fond of very hot tea. Is there any suggestion here as to cause and effect?

Hæmostatic Action of X-Rays.—L. Popp describes four cases of obstinate epistaxis which were treated by the application of small doses of x-rays (focal distance from the skin 23 cm., flash 30 cm., filter 5 mm. aluminium) over the region of the spleen, the hæmorrhage being stopped in each case. This effect of x-rays is explained as being the result of an overproduction of thrombokynase either from the reticular endothelium of the spleen or from the destruction of white blood corpuscles. It has long been known that by stimulation of the bone marrow by x-rays the number of the blood platelets is raised with a resulting increased amount of coagulation ferment, and the method has been usefully employed in hæmophilia and in cases of severe purpura. The effect of x-rays in hæmorrhagic diathesis persists for only a few days, but the arrest of the hæmorrhage enables further medical treatment to be applied. The application of x-rays has been used in cases of metrorrhagia and menorrhagia, and it is also recommended twenty-four hours before operations likely to be accompanied by severe hæmorrhage.—*Wien. klin. Woch.*, August 11, 1927, p. 1029).

CARCINOMA OF THE STOMACH*

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CARCINOMA of the stomach, like all carcinomata, has a fatal issue in every instance in which it cannot be extirpated. The economic seriousness of this disease can best be appreciated by the fact that in the United States 90,000 people die of carcinoma each year. Of this number, 34,000 die of carcinoma which originates in the stomach. Carcinoma arising in the pyloric end of the stomach presents anatomical conditions admirable for its thorough surgical extirpation.

One must then look for a factor or factors responsible for this unusually large number of fatalities. The general conception of this disease by the laity, and unfortunately by a large percentage of our own profession, is that it is an inevitably fatal disease, and that the most any therapeutic measure can offer is a poor attempt at palliation. This conception of gastric carcinoma leads to such a hopeless attitude that many physicians and surgeons make no serious attempt to diagnose the disease in its early stages, believing that their best efforts will produce nothing but an unhappy issue. The remarks which follow are based on personal contact with seventy-five cases of gastric carcinoma.

I should like to make a plea that we reverse our attitude to this disease, and, instead of speaking of the mortality factor, stress the incidence of cure. It is true that it takes a stout heart and much courage and perseverance to continually deal with such a serious disease; hence optimism is essential. This is impossible, if one constantly stresses mortality rather than cure. The ray of hope which one gets from considering the cures acts as a stimulus to greater accuracy in the early diagnosis. The early diagnosis will depend upon an appreciation of, and the correct interpretation of, the early symptomatology. Unfortunately, the criteria for diagnosis, as enunciated in practically all text-books, and unfortunately reiterated by many writers, demand for their presence a disease so far advanced that the possible hope of a permanent cure is lost.

In considering this disease in a broad way, and approaching it from a clinico-pathological angle, it is possible to divide gastric carcinoma into two large groups, each presenting a different symptomatology.

In the first group, the pathological picture is that of a massive tumour situated in the stomach, with a relatively small ulcerative process; that is, the ulcerated area of the tumour is small in proportion to the whole tumour bulk, which latter is due to the proliferation of the malignant cells, plus the associated surrounding inflammatory reaction.

In the second group, we have the pathological picture reversed, the predominant factor being the ulceration, surrounded by a very small area of induration, in fact so small that, even with extensive ulceration, a tumour is rarely palpable even in the terminal stages of the lesion.

It thus becomes obvious that there must be two distinct life histories in a disease manifesting itself by two such diverse pathological lesions. In order to work out the symptomatology in these two groups, it is necessary to enunciate what is considered to be an essential factor in the production of gastrointestinal distress. The wealth of evidence, clinical, physiological, and from animal experimentation, would lead one to believe that obstruction of the tract is essential to the production of pain or distress, providing the musculature of the tract is capable of normal tonic contraction. Such obstruction, one must clearly appreciate, may be either mechanical or the result of muscle spasm. Peristalsis in the gut or stomach, proximal to this obstruction, produces an increased intra-intestinal or intra-gastric tension. This is the physiological state necessary for the presence of distress or pain. Whether it be distress or pain will depend upon the degree of intra-intestinal or intra-gastric tension. In the first group, the obstructive

* Read at the meeting of the Surgical Section of the Academy of Medicine, Toronto, November 15, 1927.

lesion is mechanical by virtue of the bulk of the tumour. In the second group, the obstruction is spastic, the result of muscle-spasm, caused by the inflammatory reaction in the stomach wall in the neighbourhood of the malignant ulcer. This fundamental difference in the causation of symptoms, to my mind, explains the divergent life-history of the disease. The typical story in the first group, that is where the lesion is massive, with a minimum of ulceration, will be as follows: An individual, who had never suffered previously any gastro-intestinal discomfort, in fact often boasting of his ability to digest any and all kinds of food, finds after a period of increasing fatigue, which he can always explain satisfactorily to himself, that he has much less desire for food. This lack of desire, as we know from Carlson's experimental work, is due to the incapability of the stomach musculature to undergo normal tonic contractions. Therefore by the time the individual has suffered from undue fatigue, and is manifesting a lack of relish for his meals, there is present a tumour of sufficient volume to have caused mechanical obstruction to the emptying of the stomach, with an associated gastric dilatation of such degree that normal tonic contractions are impossible. Let me also emphasize that, on physical examination, nothing abnormal will be found, except in rare instances when a palpable tumour is present. A search of the stool will rarely demonstrate occult blood, nor will there be any secondary anæmia at this stage of the disease. This appears to be very slim evidence upon which to base a diagnosis of gastric carcinoma, but it is surely sufficient evidence to justify more than the routine prescription of "bismuth and soda; come back in two weeks". If with such a story, radiographic examination of the stomach be made and a negative finding recorded, no harm is done, and if a positive finding be recorded, the patient has an opportunity of being cured. There is one sad factor in this group of cases, namely, that, should such a pathological process originate in the mid-gastric or cardiac areas, the bulk of tumour necessary for the production of an obstruction with the above resultant symptoms is so great that it will be inoperable by the time the first warning had occurred. We have comfort, however, from the fact that in the reported series of cases, 76 per cent are found in the region of the pylorus, 12 per cent in the mid-gastric area, and 12 per cent in the cardiac area, so that by a keen appreciation of the early, and on the surface trivial symptoms, we have the possibility of diagnosing 76 per cent of cases of carcinoma of the stomach in this group at a stage when radical operation is possible.

One additional symptom which we have noticed occurring in both groups has been retrosternal distress, often described by the patient as pain, and not associated necessarily with the ingestion of food. May this be due to spasm of the œsophagus, the result of irritation of the vagus by the primary growth? While we have all occasionally seen this symptom present in patients suffering from cholecystitis, one must consider it seriously when it does occur as an early symptom in gastric carcinoma, a disease whose earliest manifestations are so trivial.

The further evolution of the life history of this first group of gastric carcinoma cases makes the diagnosis very obvious, as the distaste for food develops into complete absence of any desire, coupled with vomiting at the end of the day, when often food taken in the morning will be ejected. In a certain percentage of cases a palpable tumour is present. To wait until the development of these obvious signs, particularly the presence of a palpable tumour, is to deprive the patient of any but a very remote chance for permanent cure.

The second group of cases offers greater possibility of surgical extirpation, because of the relatively local character of the lesions, and the relatively slow rate of growth. In connection with the slow rate of growth of gastric carcinoma, it is interesting to note that, in various groups of records from the operating room and post mortem room, from forty to sixty per cent of patients who die of carcinoma of the stomach die without metastases in the liver. The local extension to the regional lymph-glands, pancreas, and transverse colon is the factor which most often precludes radical extirpation. Mechanical obstruction, with the inevitable starvation, secondary anæmia from continuous, though often microscopic, bleeding, together with secondary infection in the ulcerated area, are responsible for the final fatal issue.

This appreciation of the relatively local nature

of carcinoma of the stomach gives us additional hope of cure, if only one can diagnose it sufficiently early to permit of its thorough removal. While in this group of cases we are stressing the ulcerative factor as the major gross pathological lesion, there is no desire whatever to open the age-long and still unsettled problem of the relationship between gastric ulcer and gastric carcinoma. It appears almost impossible to establish on a sound basis criteria sufficient to state whether an ulcer has become carcinomatous. There are certain facts, however, in connection with gastric ulcer, which I feel are worth appreciating in this connection. In the Mayo Clinic, gastric carcinoma is found three times more frequently than gastric ulcer. In this series of cases, we have operated upon forty-five cases of gastric ulcer and seventy-five cases of carcinoma of the stomach. Dr. Wookey, in reviewing the specimens mounted in our museum as benign gastric ulcer, found that 18 per cent of the specimens so labelled were in reality, on re-examination, gastric carcinoma. Finsterer, in 145 cases of resections for clinically benign gastric ulcers, found that microscopic examination proved 21 per cent to be malignant.

The death rate following operation for duodenal ulcer is less than the normal expectancy of the population in general. This is probably explained by the additional care which such individuals take in regard to their general health. The death rate following operation for gastric ulcer, where the ulcer is not removed, is three times greater than normal expectancy, many of the deaths being accounted for by gastric carcinoma. The incidence of gastric ulcer increases gradually from fifty to seventy years of age. In our series, no case of carcinoma having continuous gastric symptoms for two years presented any brilliant prospect of cure. In the routine admission to the Toronto General Hospital for five years, from January 1, 1921, to December 31, 1926, there were 167 cases of ulcer of the stomach and 217 cases of carcinoma of the stomach. Allowing for our proved 18 per cent error in the diagnosis of the non-operated gastric ulcers, this would give an additional sixteen cases of carcinoma, making the revised statistics 151 cases of ulcer of the stomach and 233 cases of carcinoma. While it has been definitely stated that this is not intended as an argument for the transformation of a benign into a malignant ulcer, there are lessons to be learned from these facts. When so keen an observer as Finsterer, aided by an efficient x-ray service, fails in over 21 per cent of cases to recognize an ulcer as malignant, we must always be on guard that in the non-operative treatment of gastric ulcer we are not attempting to cure a gastric carcinoma. The same principle influences the surgical therapy of gastric ulcer, insofar that the operation will prove futile, even without an operative mortality, in from 18 to 21 per cent of cases, if the ulcer is not removed. The fact that, in our series, no case of carcinoma of the stomach with a continuous gastric disability for two years offers any brilliant hope of cure, leads one to suggest that when a gastric ulcer which has been controlled by non-operative measures, again becomes active, the patient be advised to have it excised, not that the ulcer may become malignant, but because of our inability to give more than a 79 to 82 per cent accurate diagnosis of benign ulcer. We know, and must remember, that the major portion of the local lesion in malignant ulcers is due to the peri-malignant inflammatory reaction; *hence the accepted non-operative therapy for benign ulcer, used in a malignant ulcer, will allow a subsidence of the inflammatory reaction, with an apparent cure of the patient, as manifested by temporary relief of symptoms.* Is it too much to ask that the patient, relieved of his symptoms from a gastric ulcer, return at the end of three months for a re-check, both clinical and radiographic, in order that we may not have missed a malignant ulcer?

The symptomatology of this group is essentially different from the former, because the inflammatory reaction around the ulcer produces a muscle spasm, and the patient experiences pain or distress in association with the ingestion of food. One hears much controversy regarding pain as an early symptom in gastric carcinoma. The differentiation of these two pathological lesions found in gastric carcinoma would make it apparent why pain may be present in some instances and absent in others. Hence, for a time, the life history of the disease in this second group of patients suffering from gastric carcinoma will simulate almost identically that of benign gastric ulcer, that is, pain and distress associated with food, and the almost constant

presence of blood in the stool, with the attendant secondary anæmia; this symptomatology being relieved temporarily by any of the accepted non-operative managements. However, as one follows the life history of this disease, *there arrives a time when there is a change in the character of the distress.* It is not relieved as was formerly the case. Pain in the back becomes one of the most frequent additional complaints, due to the involvement of the pancreas in the ulcerative process. When this change in the symptomatology occurs, there is also a change in the local pathological lesion. The malignant process replaces the inflammatory reaction as the predominant lesion, and instead of spasm which was induced by the inflammatory reaction, we have an upset of the normal gastric motion by virtue of the fact that the malignant involvement of the area of the stomach interrupts and renders impossible anything approaching a normal peristaltic wave. *This change in the character of the symptoms has the gravest import,* and must be regarded very seriously, and a very thorough, complete, and painstaking clinical and radiographic investigation instigated. That this change in the character of the symptomatology must always mean malignancy, of course, is not true, as one sees it also in the benign ulcers which have extended farther afield than the stomach wall itself and involve adjacent structures. However, whether clinical and radiographic examination demonstrate it as a simple or a malignant ulcer, operative interference is indicated, as experience has shown that non-operative therapy in these extensive ulcers involving adjacent structures is most unsatisfactory. Hence *a change in the life history of the disease is sufficient justification for not only advising, but urging the patient to have a laparotomy.* By assuming this attitude, we have the possibility of giving a group of carcinoma patients the benefit of radical extirpation. This group is equal to from 18 to 21 per cent of the group of gastric ulcers clinically diagnosed as benign ulcers, in which it is impossible to diagnose the carcinoma. Granting that the internist, and more particularly the family practitioner, will seriously consider their cases of so-called "indigestion" with the above facts in mind, there will be presented for surgical therapy a larger percentage of patients capable of receiving the relief which surgical therapy alone can offer.

In our own series, it was only possible to resect the stomach in 50 per cent of the cases which presented themselves. This is a high average for all cases of gastric carcinoma, as cases obviously hopeless are not asked to consult the surgeon. In 25 per cent, a palliative gastro-enterostomy was possible. While even these figures would apparently indicate that 50 per cent have a potential possibility of cure, such is not the case, because one finds in at least 50 per cent of the resected cases that as the operation proceeds, there is an extension beyond the possibility of complete surgical extirpation, and in a smaller number, approximately 10 per cent, a resection is undertaken because it offers a longer freedom from symptoms than a palliative gastro-enterostomy. The average duration of life following a palliative gastro-enterostomy has not been greater than six months, and while life has been maintained for six months, at least 50 per cent of this added life is associated with extreme discomfort, and it makes one question whether the short interval of comfort, together with a primary mortality approaching 25 per cent, justifies a palliative gastro-enterostomy without very careful consideration. Resection, on the other hand, even when the hope of permanent cure is not justifiable, does give a greater length of life and comfort than gastro-enterostomy alone. The writer has had three instances in which a block resection of the stomach and transverse colon was done for extensive carcinoma. One patient, after five months' comfort, died with one month's distress. The other two patients, who have reported by letter within the last two weeks, are alive and well respectively twenty-seven and twenty-two months after operation. The index of their well-being is the fact that one is applying for life-insurance, and the other man, a mining engineer, has just returned from a mineralogical survey in Red Lake District. Involvement of the pancreas is not a barrier to resection, as in many instances the face of the pancreas has been shaved off in order to separate the growth during an operation.

Apart from the extensive character of the disease and technical errors, what are the factors responsible for the high mortality,

which in our series is 25 per cent up to January, 1927? Secondary anæmia, dehydration, and starvation are to my mind the three greatest handicaps, and contribute largely to the immediate mortality. Secondly, deep ether-anæsthesia, which must necessarily be prolonged, is not desirable. Accepting these factors, realizing that one cannot control the extent of the disease, and that operative difficulties will result in occasional technical accidents over which even the most expert have no control, we are left with the latter considerations, which we feel can be materially counteracted. The secondary anæmia can be controlled by blood transfusion. The dehydration and starvation can be overcome by the subcutaneous and intravenous administration of glucose in saline. We have discarded the administration of glucose per rectum, because of the relatively small amount which is absorbed, and the continuous discomfort which the patient experiences. This attitude has recently been substantiated by Levi.[1] We aim, however, to give 3,000 c.c. of fluid every twenty-four hours, and the method of continuous intravenous administration, as introduced in Toronto by Dr. R. I. Harris at the Hospital for Sick Children, has been most satisfactory, and has eliminated reactions to a very large extent, provided one does not attempt to give it too quickly. Our practice at the moment is to give between forty and fifty drops per minute. This will give, in the twenty-four hours, relatively 3,000 c.c. without depending upon oral administration. Frequent gastric lavage, to empty the stomach of the putrefying contents in cases of obstruction, is absolutely essential. In a relatively small percentage of cases there is an upset in the acid-base equilibrium, as evidenced by a decrease in the chloride content of the blood plasma and an increase in its CO^2 combining power. This must be rectified prior to operation by adding sufficient salt to the intravenous solution. Realizing that transfused blood is rapidly destroyed in most instances, we have made a practice since the first of January, 1927, to transfuse all such patients on the afternoon of the day preceding the operation. This will allow of an increased blood content at the time of the operation, when it is most needed. Deep ether-anæsthesia we have entirely replaced by combined anæsthesia, that is the patient is given preliminary hypodermic sedatives of morphine and hyoscine, followed by analgæsic gas and a field block of the abdominal wall. When the peritoneal cavity is opened. a block of the anterior parietal peritoneum is made a hand's breadth from the incision in all directions. This is followed by splanchnic anæsthesia after the method of Braun, through the open abdomen, injecting in the splanchnic area from fifty to seventy c.c. of ½ per cent novocaine, to which has been added six drops of epinephrin to every 100 c.c. In all, one uses about 250 c.c. of ½ per cent novocaine. We have used this splanchnic anæsthesia in nineteen cases, and so far have had no anxiety from its use. This permits of a prolonged operation with ideal relaxation and an almost uncanny absence of intra-peritoneal pressure, with a very slight disturbance of the patient. Since we have been using this combination, we have done fifteen resections of the stomach with two deaths, neither true operative deaths; one where the patient developed that weird condition which is labelled as acute phlegmonous gastritis, and died two weeks after the operation; the other a patient who had a year previously suffered from a very severe pneumonia, and succumbed to its recurrence ten days following his operation. Furthermore, by this combination, cases have been submitted to resection in which, with prolonged deep ether-anæsthesia, it would have been unjustifiable. Hence, we have decreased our mortality by 12 per cent and extended the limits of the operative possibilities in advanced cases. What the ultimate results will be, it is impossible to state, but one knows that, without resection, a fatality is inevitable; therefore one is justified in extending the operability to extreme limits.

One further factor in the technique of the operation, which we hope will prove advantageous, is the excision of the entire lesser curvature. Carcinoma arising independently of the lesser curvature is rare, and the extension of the disease is mainly along the lymphatics, associated with the left gastric vessels. Hence, it is felt that if one can remove the entire lesser curvature, one has not only removed thoroughly the associated lymphatic drainage, but also the part of the stomach in which there is a predilection for the growth of carcinoma.

Conclusions

1. The note of pessimism which is so prevalent in regard to carcinoma of the stomach is not wholly justifiable.

2. Optimism is imperative to continued stimulation of our efforts in diagnosis and treatment. Let us therefore stress the recoveries rather than the fatalities.

3. There are two distinct clinico-pathological types of carcinoma of the stomach.

4. The first type is insidious in its onset and well established before the patient is conscious of any symptoms, by virtue of these symptoms being mechanical in origin, due to the bulk of the tumour. Hence indigestion, characterized by fatigue and lack of appetite and no pain, in an individual previously free from gastrointestinal disturbance, must be considered very seriously.

5. In the second group, the ulceration is the prominent factor; the bulk of the lesion is small; the symptomatology is similar in the early stage to benign gastric ulcer, and temporary relief follows dietetic treatment.

6. From 18 to 21 per cent of clinically benign gastric ulcers are, on microscopical examination, found to be malignant.

7. Patients diagnosed as suffering from a clinically benign gastric ulcer, rendered symptom-free by diet, should be re-examined clinically and by x-ray investigation at the end of three months.

8. A change in the character of the symptoms in a patient suffering from a clinically benign gastric ulcer, justifies not only advising, but urging a laparotomy.

9. The daily administration of 3000 c.c. of glucose in saline, combined with blood transfusions, will often convert a desperate operative hazard into a reasonably safe risk.

10. The replacement of deep ether-anæsthesia by combined anæsthesia of analgæsic gas, with abdominal field block and splanchnic anæsthesia, by the method of Braun, is a very marked factor in the operative safety.

11. The serious investigation, primarily by history and secondarily by competent radiographic methods, is our only hope of altering the staggering mortality and economic loss caused by carcinoma of the stomach.

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SOME DISABILITIES OF THE SHOULDER REGION

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In these days the economic aspect of medical practice is attaining greater and greater importance. Successful treatment is measured not merely by the degree of success in restoration to the normal, but also by the speed with which the result is attained. The patient himself is mainly interested in the completeness of recovery; the nation as a whole and the employer of labour in particular are especially interested in the rapidity with which function is regained. The surgeon is interested to an equal degree in both. He aims at securing the maximum restoration in the minimum time. We have for long recognized these two factors in the case of injuries to bone. Of recent years, the joints have demanded more and more attention from the same point of view. In using the word "joints" I do not mean merely the articulation, but the whole joint mechanism, bones, cartilage, synovial membrane, muscles, tendons, bursæ, nerves. In cases of fracture, the surgeon who is willing to give the necessary time and care, and to utilize all the resources of modern surgery, can depend on obtaining an overwhelming proportion of successful results. In the case of joints, this is not so. Restoration is likely to be less complete, and the time taken to be appreciably longer in the case of injuries to the joint mechanism than in the case of fractures. This is nowhere so marked as in the shoulder joint. Every surgeon who sees a large number of cases of shoulder injuries must be impressed by the relative lack

of success in dealing with them. There are a good many reasons why this should be so. They all depend upon one big principle. The keynote of the upper limb is mobility. This mobility is so great that within its limit of range, the hand can be placed in any spot that is within the field of vision. To accomplish this the shoulder is of the ball and socket type of joint. It has movements not merely of flexion and extension, but of abduction or adduction, of external and internal rotation, and a combination of these known as circumduction. This mobility has been purchased at the price of diminished stability. In all animals except man, the upper limbs subserve in whole or in part the function of locomotion. In man alone they are set entirely free from this duty. Hence in man, the upper limbs are delicate rather than powerful; freed from the necessity of supporting the trunk, the connection between upper limb and body need not be and is not nearly so secure as in those animals where weight-bearing is a part of their duty. In other words, not merely is the upper limb less massive, but the shoulder girdle is less securely fixed to the trunk. Again, so far as I know, man is the only animal in whom active abduction against resistance systematically takes place at the shoulder joint, as in the action of pitching sheaves, or in much of the work of artisans, such as carpenters or plasterers. Birds exercise the function of abduction of the wing, but in a very different way. One of the pectoral muscles has its tendon playing through the secure foramen triossium. The muscular mechanism involved is very different from that of man. Adduction and abduction are possible in many of the lower animals, *e.g.*, the squirrel can hold a nut between the forepaws; the kitten playing with a ball can tap it with the motion of adduction, but these movements are always limited, and in animals such as the ungulates, there is no adduction or abduction possible at all. With large heavy bodies, such as they have, they dare not sacrifice stability. Hence dislocation of the shoulder in the lower animals is extremely rare, in man extremely frequent.

Let us look for a moment at the shoulder girdle. It has been much modified from the primitive triad of coracoid, pre-coracoid, and scapula. The scapula is large, has lost its connection with the trunk, while the coracoid is reduced to very small proportions. The pre-coracoid has disappeared, its place being taken by the clavicle, a bone of comparatively recent institution.

Direct connection with the trunk is established only by the clavicle, and the linkage between clavicle and scapula consists of the acromio-clavicular joint, and more especially the coraco-clavicular ligaments—conoid and trapezoid. The adjacent parts of clavicle and acromion do not habitually take a strain, hence these bone ends are not expanded, and, if the appropriate force be applied, the joint is found to be comparatively insecure. The main strain is passed through the conoid and trapezoid ligaments. Dissection of these will show that the fibres of both ligaments have a direction upwards and laterally, *i.e.*, they are designed to prevent the scapula being pushed medially. The coraco-clavicular ligament is the structure upon which the clavicle depends that it may function as a strut to the upper limb, keeping it at a fixed distance from the trunk. In the acromio-clavicular joint, there is a meniscus of fibro-cartilage with a free edge, and this when injured may be a source of disability, just as occurs with the torn meniscus in the knee joint.

One of the most obvious structures seen in examining a shoulder joint is the tendon of the biceps (long head) passing freely through the joint cavity. It is enveloped in a sheath of synovial membrane but this is everywhere free from the joint capsule. In different animals the relation of the biceps tendon to the capsule is very variable. In the horse it is a powerful structure lying outside the capsule. Even in animals where the tendon is within the joint cavity there is always a reflection of synovial membrane from the anterior margin. According to Parsons, man is unique in possessing a biceps tendon which is free in the joint, and possibly the superior gleno-humeral fold is the representative in him of the mesentery-like fold of synovial membrane. At no time during life does man possess a meso-tenon of this kind for the biceps. Absorption occurs before birth. One consequence of this is that the blood supply of the tendon is comparatively poor. On this account the possibility of repair after injury is somewhat meagre. This fact is probably of much importance in many tedious cases of shoulder disability.

One other anatomical structure must be mentioned, the sub-acromial or subdeltoid bursa. It has achieved of late years some notoriety, inasmuch as the caption "sub-acromial bursitis" has been used as cover for a multitude of inexact diagnoses. In this respect it has a social standing little if any above the terms "rheumatism" and "eczema." Codman, who has directed our attention to this part for over twenty years, has recently put in a plea for more frequent exploration of the bursa, since in his opinion, the subacromial bursitis is most often secondary to a more serious lesion, especially rupture of the supra-spinatus tendon. Recognizing the indefinite character of our diagnosis, the French refer to "Peri-arthritis of the shoulder", a term which is broad enough to include almost any break-down in the shoulder mechanism, whatever the cause.

The variety of conditions which may give rise to functional disability at the shoulder is very large. I do not intend to speak of acute infections of the joint, or chronic conditions such as tuberculosis or syphilis. These do not differ materially from similar conditions elsewhere. Neuropathic joints, such as occur in tabes or syringomyelia, are usually easily recognized. Chronic abscess of the head of the humerus may escape recognition, unless a radiograph of the opposite shoulder is taken for comparison. Villous arthritis may affect the shoulder equally with the knee and the ankle, and teno-synovitis affecting the long head of the biceps may occur as an occupation lesion.

Adhesions may form in the shoulder joint after trauma. This is a very common condition following Colles' fracture. Osteo-arthritis in the shoulder is frequently met with. This is usually of the atrophic type. The muscles about the shoulder may show tender nodules, such as we call fibrositis, and spicules of bone may develop at the points of attachment of tendons and of muscle fibres, as in other parts of the body.

Sometimes a sesamoid bone is developed in a muscle forming an actual joint which may become inflamed. These will not be considered on the present occasion.

Loss of function of the shoulder joint may be a pure psychosis, as in a patient who complained of severe pain on attempted movement and loss of power, but presented no abnormal sign and no diminution of the range of active movement. The key to the condition was obtained when it was discovered that the patient had a grown up daughter, who was maintained by the father in idleness while the patient herself had to work. The painful shoulder was doubtless a subconscious protest against the injury of having to work for an able-bodied daughter, added to the insult of the latter having supplanted her in the father's affections. Hysteria is very common in shoulder joint injuries, particularly among the south-eastern Europeans, who contribute so largely to the ranks of unskilled labour in this country, though it is by no means confined to them, even members of the Nordic super-race being susceptible. The area of analgesia usually includes the pectoral region, the scapular region, and the whole of the upper limb, *i.e.*, it is usually more extensive than the sleeve analgesia. One must guard against assuming that a hysterical subject has no organic lesion. Sometimes the condition is a pure hysteria; more often it is combined with a definite anatomical derangement.

Lesions of the brachial plexus are comparatively common. There may be a fully developed Erb's palsy. Not seldom, however, there is a lesion confined to the fifth and sixth cervical nerves, affecting mainly the infraspinatus. This is associated with forcible separation of the head and shoulder, as in a headfirst precipitation such as falling down stairs. A similar lesion came under my notice affecting the right shoulder, as the result of prolonged cranking of a Ford car during intensely cold weather.

Paralysis of the serratus anterior is also seen, giving the "winged scapula", sometimes in association with diseased teeth or tonsils, and therefore presumably toxic in origin. These cases usually clear up. Poliomyelitis may also affect the shoulder muscles, and in this case the outlook is not so good, unless treatment is vigilant and prolonged, and sometimes not even then. As in the case of other joints, the shoulder may give shelter to loose bodies. These are not at all frequent and may easily be overlooked.

Recurrent dislocation of the shoulder is a very disabling condition. It can be dealt with quite

satisfactorily by the Clermont operation, in which a flap from the posterior border of the deltoid is brought forward through the quadrilateral space and attached to the coracoid process, or if the flap cannot reach here, to the tendon of the coraco-brachialis and short head of the biceps.

To my mind, the most interesting aspect of the shoulder situation at present is that which regards the relations of tendons to the function of the joint.

Verrall has described an interesting condition. "Owing to long continued strain of the arm in a person unaccustomed to great exertion, abduction of the shoulder becomes limited in extent when an attempt is made to perform it with the arm in the coronal plane. If however, the arm is brought forward, a painful snap is felt or even heard over the front of the joint, and the arm can then be freely abducted. This is attributed to slipping to and fro of the short tendon of the biceps over the lesser tuberosity of the humerus and the subscapularis tendon which immediately underlies it. The condition is thus purely mechanical and the results of treatment confirm this view."

Rupture of the Supra-Spinatus Tendon

How frequent is this injury? We do not know. If left to themselves, ruptured tendons will heal by scar tissue, but owing to poor vascularity this healing is extremely slow. According to Codman, about one-third of old cases of traumatic subacromial bursitis are due to lesions of the supra-spinatus tendon. In Brickner's opinion, the primary cause of subacromial bursitis is always traumatic, never toxic. Further, he believes that subacromial bursitis is probably always associated with injury to underlying tendons, especially the supra-spinatus. The injury may be a sprain-fracture, and this fact may be made out by radiograph, provided the angle of exposure be suitable. More often the x-ray picture is negative. It may be necessary to take skiagrams of the joint in more than one position, in order to show the detached fragment of bone. The tendon may rupture just proximal to its attachment. After rupture, some substance opaque to x-rays may be deposited in the gap. This is presumed to be calcareous, and may disappear spontaneously or as the result of treatment. "All degrees of rupture may occur from a nick in the tendon to complete evulsion of the supra-spinatus and adjoining parts of the infraspinatus and subscapularis. If the rupture is complete the patient is permanently disabled." So unsatisfactory are the results of our treatment that one welcomes the statement from Codman that "if a man cannot actively abduct his arm, and especially if after you have abducted it for him, he cannot hold it at the horizontal against moderate downward pressure, you may be sure enough of the diagnosis to justify exploratory incision of the bursa." The results of suture of the tendon are said to be good though not brilliant.

Meyer has drawn attention to another pathological condition of the shoulder which surgeons have largely overlooked, *viz.*, destruction of the tendon of the long head of the biceps. He describes a series of specimens showing all stages from thinning of the capsule of the joint to fraying and ultimate destruction of the long biceps tendon. In such cases the tendon generally acquires a new attachment in the neighbourhood of the tuberosities, frequently to the shaft just distal to the lesser tuberosity. These specimens obtained in the dissecting room all showed osteo-arthritic changes. Meyer attributed the development of the lesion to occupational stresses especially with the arm abducted and rotated externally. In this position the long tendon of the biceps is compressed between the acromion above and the tuberosities of the humerus below. As a result of this repeated strain the tendon undergoes attrition. In one case both sides were affected. The specimens were equally right and left handed. Females as well as males showed the abnormality.

The main purpose of this paper is to sound a note of discontent. Our results in shoulder injuries are not satisfactory. Radiant heat, massage, diathermy, have their place, but in too many cases they play the part of the "something being done," which sustains the patience of surgeon and sufferer alike, while nature makes an effort at repair. More precise knowledge of the lesion in the individual case will enable us to help nature to go farther and to fare better.

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THE USE AND INTERPRETATION OF BLOOD CHEMISTRY BY THE GENERAL PRACTITIONER*

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BLOOD chemistry is of importance to the general practitioner in two ways; firstly, he may employ it in his daily practice, and secondly, he comes into contact with it in his medical reading. If properly employed and interpreted, it can be of the very greatest aid in diagnosis and as a guide to treatment. Any disregard for it, I would suggest, usually arises from improper interpretation.

There are really only a limited number of chemical substances in our blood which can be determined with sufficient accuracy, and concerning which we have sufficient knowledge, to make them of major importance. Of these few I propose to speak to-day, dealing in the main with their proper interpretation.

Primarily, when any physician decides to have a blood chemical determination made he should have a clear idea of why he desires it. In hospitals I find a mental laxness on the part of some. The attending physician may tell the house-officer to have the "blood chemistry" determined, not defining what or why. The result is a hit or miss requisition, and many unnecessary time-consuming determinations are performed.

In most instances the physician will have to rely upon the laboratory to which he submits his specimen for accuracy of technique. But he must not expect the laboratory to interpret the results more than in a very general way. In the same way as albumen in the urine may or may not be of importance when interpreted in conjunction with the full clinical data, so must the results of chemical determinations be reviewed.

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THE TECHNIQUE OF OBTAINING BLOOD SAMPLES

In order to derive the greatest benefit from any chemical determination on the blood, the specimen must be properly taken. This is a precaution frequently neglected, resulting in an inaccurate report. Since most chemical methods require one or more cubic centimetres of blood for any one chemical determination, it is usually customary to withdraw the specimen from a vessel with a needle and syringe. In most instances it would be preferable to use arterial blood, but, since the technique of arterial puncture has not become general, we content ourselves with venous blood taken from one of the larger veins passing the antecubital fossa of the elbow. Use an all-glass Luer syringe and a needle sterilized by boiling. Be sure to expel all water from the syringe and needle. A few residual drops will sometimes cause hæmolysis. Introduce the needle into the vein which has been moderately distended by a circular elastic band on the upper arm. *Precautions*: (1) Never tighten the band on the upper arm sufficiently to cut off the arterial circulation; (2) never cause venous stasis for more than one minute before withdrawing the sample from the vein. After sufficient blood has been obtained release the compression on the upper arm before withdrawing the needle from the vein.

Immediately introduce the sample of blood into a small dry Erlenmeyer flask or test tube, which contains the chemical substance chosen to prevent clotting, if that is desired. Powdered anhydrous potassium oxalate is most frequently used for this purpose, 20 mgm. for each 10 c.c. of blood, approximately the amount held on the point of a small knife-blade. Blood taken thus will maintain most of its chemical constituents constant for a matter of several hours. When

sugar or carbon dioxide determinations are contemplated, extra precautions are essential. Due to glycolysis sugar will rapidly disappear from oxalated blood. Thirty minutes even may cause a change. Accordingly, some preservative must be used. For this purpose formalin is the most satisfactory, 1 drop to each 5 c.c. of blood. Then glycolysis is arrested and the blood sugar will remain constant for three days. This allows sufficient time for mailing if so desired. Since carbon dioxide is usually determined upon plasma, it must be separated from the red cells, if more than thirty minutes are to elapse before the actual determination is made. When the two, that is red cells and plasma, remain in contact, diffusion of electrolytes takes place which alters the amount of base (Na-K etc.) present in the plasma which is capable of combining with carbon dioxide. Thus the result is vitiated. This can be prevented by centrifuging the oxalated blood, and pipetting the plasma into a test tube which has been coated on the inside with a thin film of paraffin. The paraffin inhibits diffusion of base (Na) from the glass.

The Blood Sugar

The level of the sugar in our blood is determined by the balance between those forces which are tending to elevate it and those which are tending to lower it. Absorption and conversion of glycogen into glucose (glycogenolysis) are pitted against oxidation and storage as glycogen. The remarkable fact is that these factors are so nicely balanced that in the normal individual the venous blood sugar ranges only from 0.08 to 0.12 per cent. Lowest before breakfast in the morning, it rises a little after each meal, to return to its fasting level before the next meal. Why our blood sugar is set at this level is not known.

When the balance between those factors which are tending to elevate or to lower the blood sugar becomes upset we frequently find hyperglycæmia or hypoglycæmia. Glycosuria in the normal person follows only when the venous blood sugar reaches a level of approximately 0.18 per cent. This level is termed the glucose threshold in the kidney. Thus there may be appreciable hyperglycæmia without glycosuria.

With these thoughts in mind, it can be seen that hyperglycæmia with glycosuria can be produced by any of the following states.

1. A defective oxidation of glucose by the tissues;
2. Defective conversion of glucose to glycogen (storage);
3. An excessive rate of absorption (where storage and oxidation cannot compete);
4. Abnormally rapid conversion of glycogen to glucose (usually through stimulation of the sympathetic nerve supply to the liver).

Likewise hypoglycæmia may result from:

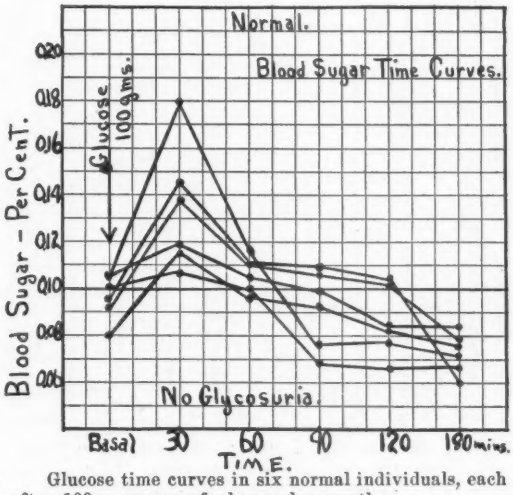
1. Sudden excessive storage as glycogen;
2. Excessive oxidation of glucose.

A single blood sugar test simply tells us the resulting balance of these two lines of forces at any one time. Before breakfast in the morning the blood sugar is lowest, because the factor of absorption is eliminated. After breakfast, during the digestion period, the factor of absorption temporarily predominates and there is a slight rise. Thus enters the significance of the time factor.

The Glucose Time Curve.—In order to throw further light on the response of these balancing forces, a "glucose time curve" is frequently done. By giving the individual a dose of 50 to 100 grammes of glucose by mouth we ask the intermediary carbohydrate metabolism of the host to meet the emergency. Both sets of factors come into play, and, by obtaining the blood and urine at frequent intervals, we are able to draw some valuable conclusions.

The Normal Glucose Time Curve.—In Chart I are shown six normal curves, each after 100 grammes of glucose. With fasting blood sugars, ranging from 0.08 to 0.11 per cent, the maximum rise was obtained in thirty minutes. Rarely

CHART I.



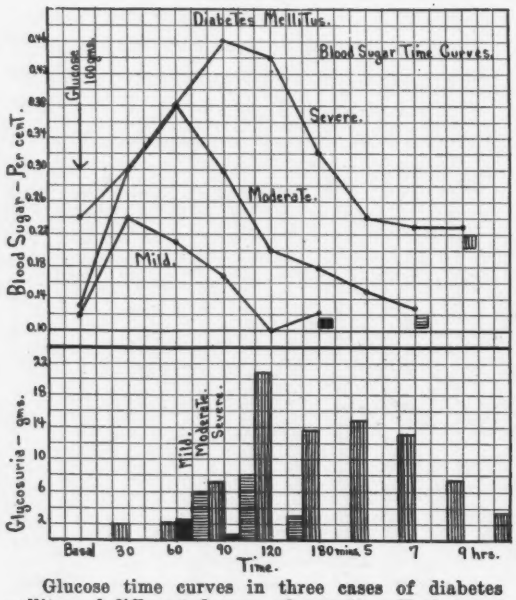
Glucose time curves in six normal individuals, each after 100 grammes of glucose by mouth.

does this "'peak value" exceed 0.18 per cent. Subsequently, the blood sugars returned to their fasting values in sixty to ninety minutes; they then dropped a little below the fasting values, in a few cases to the upper level of hypoglycæmia. There was no glycosuria.

These six curves are quite typical of the normal reaction. During the period of a rising blood sugar the factors of storage and oxidation cannot keep pace with absorption. Then comes the time when the former predominate and the blood sugar starts to fall. The rapidity of the drop is largely a matter of storage. A probable contributing factor to the rate of decline is that the rise in the level of the blood sugar stimulates insulin production which markedly accelerates storage. This accelerated rate of storage accounts for the subsequent decline into the upper levels of hypoglycæmia.

The Diabetic Glucose Time Curve.—By true diabetes mellitus I mean a condition in which there is fundamentally an impairment of the production of the internal secretion of the pancreas, this specific substance now being called insulin. We now know that insulin accelerates glycogen storage and, indirectly, glucose oxidation. With varying degrees of impairment of insulin production one obtains glucose time curves as shown in Chart II. Since the factor of absorption of glucose on the part of the intestines is not impaired, a rapid rise in the blood sugar follows. The maximum level of the blood sugar is largely determined by the effectiveness of glycogen storage, varying directly as the impairment of insulin production. Thus, the factors of storage and oxidation being defective, the rate of decline of the blood sugar is much delayed. Glycosuria varies directly as the level of hyperglycæmia exceeds the glucose threshold in the kidney.

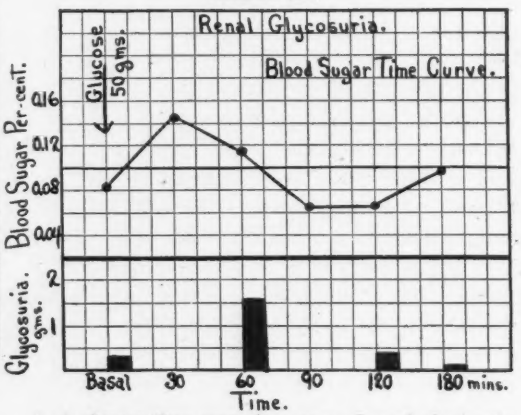
CHART II.



Glucose time curves in three cases of diabetes mellitus of different degrees of severity. Each curve followed 100 grammes of glucose by mouth.

The Glucose Time Curve in Renal Glycosuria.—Frequently the general practitioner meets with a case of glycosuria, occurring without the symptoms of thirst, frequency, and loss of weight, so characteristic of true diabetes mellitus. The glycosuria may be discovered during a routine examination. If there are no symptoms characteristic of true diabetes mellitus, and if the glycosuria does not appreciably decrease by cutting down the carbohydrate intake, the condition of renal glycosuria should be suspected. Since renal glycosuria is a local functional disturbance in the kidney, whereby, presumably, the glucose of the glomerular fluid is not completely reabsorbed in its passage through the renal tubules, one would expect to find a normal blood sugar. Pancreatic function, oxidation and storage of glucose are normal. With the finding of a normal blood sugar content, synchronous with the glycosuria, the final evidence is obtained that a lowered glucose threshold in the kidney exists. Since simple renal glycosuria practically never progresses into true diabetes mellitus one's prognosis is excellent. No dietetic

CHART III.

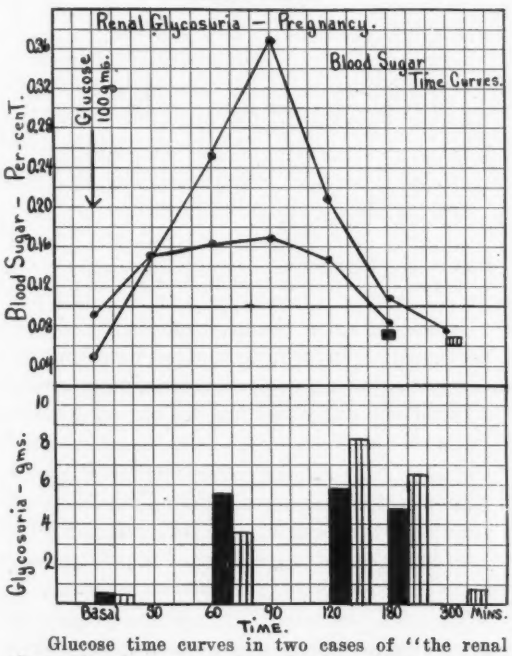


A glucose time curve in a case of renal glycosuria, after 50 grammes of glucose by mouth.

restriction is justified. A glucose time curve in such a case is shown in Chart III. Its characteristics are those of the normal curve. Noteworthy is the fact that there is continuous glycosuria, which varies somewhat as the blood sugar, but which is definitely present with a blood sugar of 0.08 per cent.

The Glucose Time Curve of "The Glycosuria of Pregnancy."—The "glycosuria of pregnancy" is really a type of renal glycosuria. It occurs not infrequently, and, when mistaken for diabetes mellitus, may lead to tragic results. The amount of glucose in the twenty-four hour urine may vary from 5 to 25 grammes or even more per day. The symptoms characteristic of true diabetes are absent, and restriction of the carbohydrate intake does not stop the glycosuria. Typical glucose time curves in two such cases are shown in Chart IV. In one case the blood sugar rose moderately but slowly, while in the other the rise was precipitous. In both the maximum peaks were reached in ninety minutes, and their declines were markedly delayed. Glycosuria paralleled fairly closely the blood-sugar curves. In both instances these cases had glucose thresholds in their kidneys of approximately 0.07 per cent.

CHART IV.

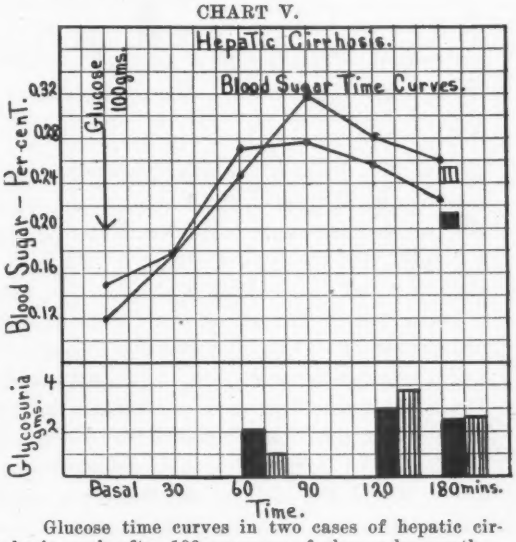


Glucose time curves in two cases of "the renal glycosuria of pregnancy," each after 100 grammes of glucose by mouth.

From these results one might be justified in thinking that there was defective glycogen storage. Probably there was, but I do not think that it was due to the same fundamental cause as in diabetes mellitus. It is of importance to note that in each case after delivery the glycosuria disappeared, due to the fact that the glucose thresholds returned more nearly to their normal levels.

The Glucose Time Curve of Cirrhosis of the Liver.—In cirrhosis of the liver the factor of glycogen storage is presumably the factor impaired. The results obtained in two such cases are shown in Chart V. In both instances the fasting values were slightly raised, and the maximum peaks were reached in ninety minutes. The declines were slow. Glycosuria paralleled the blood sugar values, there being no evidence of disturbed thresholds. Such glucose time curves are identical with those found in moderately severe cases of diabetes mellitus. Since the main function of insulin has been shown to be that of increasing glycogen storage in the liver one would not expect otherwise.

CHART V.

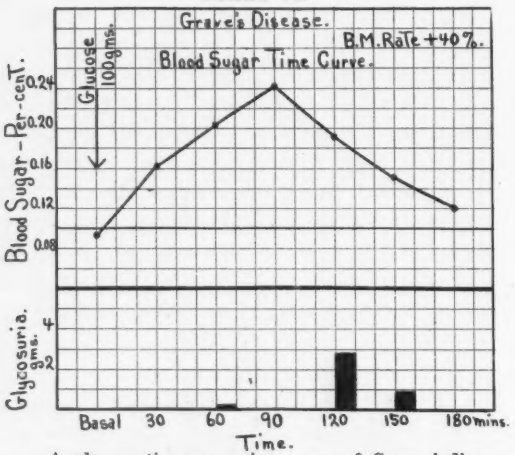


Glucose time curves in two cases of hepatic cirrhosis, each after 100 grammes of glucose by mouth.

The Glucose Time Curve of Hyperthyroidism.—Not infrequently glycosuria is found in severe cases of Graves' disease. This glycosuria may be due to the association of true diabetes mellitus. More frequently, the glycosuria results from the hyperactive sympathetic nervous system, presumably being due to increased glycogenolysis of the hepatic glycogen. In such

patients there is no evidence that absorption of glucose, its oxidation by the tissues, or glycogen storage in the liver, are defective. We think that the hyperglycæmia and resulting glycosuria are due to an excessive rate of glycogenolysis of the liver glycogen. When this latter factor is sufficiently active to overbalance storage a glucose time curve of the type shown in Chart VI is obtained. Such a curve *per se* cannot be distinguished from that obtained in a mild case of diabetes mellitus.

CHART VI.



A glucose time curve in a case of Graves' disease after 100 grammes of glucose by mouth. The basal metabolic rate was +40 per cent.

The Non-Protein Nitrogen Substances

In our blood there are two kinds of nitrogen; that which is contained in the colloidal protein molecules, namely serum albumen and serum globulin; and that which is found in a non-colloidal state. The latter is termed the non-protein nitrogen, and includes the nitrogen in urea, uric acid, creatinine, and amino-acids. These nitrogen-containing substances are derived from the intermediary metabolism of the colloidal protein molecule through oxidation, and are end-products in the metabolism of man. They leave the body largely by the urine. Therefore, the maintenance of their average level of concentration in the blood in part depends upon kidney function. Their level of concentration in the blood at any given time depends, like the blood sugar, upon the balance between those factors which are tending to raise their values, namely, protein oxidation, and those which are lowering them, namely excretion. Normally, the kidney concentrates creatinine with the greatest ease, urea next, and uric acid with considerable difficulty. For that reason, in early degrees of renal failure uric acid and urea are retained in the blood, while creatinine is only retained when the kidney disturbance is more marked. Due to the fact that an elevated blood uric acid content is found in so many other conditions than nephritis, its proper interpretation is not always clear.

The normal range of concentration of these substances in the blood is as follows:

Total non-protein nitrogen	= 30	to 40	mgms. per cent.
Urea	= 25	to 35	mgms. per cent.
Urea nitrogen	= 11	to 17	mgms. per cent.
Uric acid	= 1	to 3	mgms. per cent.
Creatinine	= 0.5	to 1.5	mgms. per cent.

Their deviation from the normal in various diseases is shown in Table I. The figures as stated have been taken from specific cases, and are presented to illustrate the usual departure from the normal.

TABLE I.

The Non-Protein Nitrogen Substances

Diagnosis	*Non-Protein Nitrogen*	*Urea Nitrogen*	*Uric Acid*	*Creatinine*
	Milligrams per 100 cubic centimetres.			
Normal (average)	35	15	2	1
Nephritis: acute	40.6	25.2	4.5	1.4
Nephritis: chronic,				
1. Parenchymatous ..	35.4	15.6	3.1	1.2
2. Interstitial:				
Early	44	24.6	4.8	1.5
Advanced	154	124.0	9.8	7.9
Terminal	260	228.0	16.4	12.6
Intestinal obstruction ..	80.4	58.6	4.0	1.4
Burns	60.8	42.6	4.2	1.3
Gout	38.0	17.4	6.5	1.4
Leukæmia	30.2	17.8	8.4	1.3
Chronic arthritis	34.2	16.2	6.2	1.2
Acute yellow atrophy of liver	28.2	10.6	5.4	1.3
Prostatism with residual urine	45.1	25.6	5.2	1.4

It will be noted that in acute nephritis there is usually a slight retention of urea and uric acid, the creatinine value remaining normal. As nephritis progresses into the chronic types we find that two main divisions arise, when viewed from the standpoint of non-protein nitrogen retention. In the pure non-inflammatory degenerative lesions associated with œdema there is usually no retention, while in the productive or interstitial types a progressive retention develops. If, at a later date, the purely degenerative lesion progresses into a mixed lesion, then as a rule the characteristic non-protein nitrogen

retention of the latter appears. In intestinal obstruction, especially of the small bowel, marked urea without creatinine retention follows. This is considered to be due to an increased tissue protein destruction, rather than to any defective excretion on the part of the kidney. Excretion simply cannot keep pace with production. In extensive burns the same findings occur. Active gout is usually associated with an elevated blood uric acid. Why, we do not know. In the leukæmias, when there is increased destruction of white cells, the blood uric acid is greatly raised. Probably the origin of this uric acid is from the nucleo-proteins of the white cells which are being disintegrated. Again, in chronic arthritis of the atrophic or hypertrophic types the blood uric acid is usually moderately elevated; why, is not known. In acute yellow atrophy of the liver the blood urea may be found to be appreciably decreased, due to the resulting marked interference with urea formation. Where prostatism leads to residual urine and back pressure, urea and uric acid are moderately increased; this without any creatinine retention.

The Blood Carbon Dioxide

The value of carbon dioxide determinations upon the blood for the general practitioner may be questioned. Nevertheless, since it is our most accurate method of determining quantitatively the degree of acidosis present, I feel that physicians should have an intelligent understanding of its usefulness.

Normally, carbon dioxide is present in our blood in chemical combination as sodium bicarbonate, and in physical solution as carbonic acid. By far the major part is held in the former state. When inorganic or organic acids are produced to excess in our body they have to be converted into salts for their excretion by the kidney. Accordingly, base is necessary and the body draws upon its main reservoir of base, namely sodium, which is held as sodium bicarbonate. Thus, from the chemical union water and carbon dioxide are formed, and the latter is lost through the expired air. By determining the ability of the blood to absorb carbon dioxide when placed in an atmosphere containing approximately the same percentage concentration of carbon dioxide as the alveolar air, and extracting the carbon dioxide in a vacuum, we obtain what is called the carbon dioxide capacity of the blood.

There are two main types of acidosis in which a knowledge of the carbon dioxide capacity of the blood is of great value. The first is that typically found in diabetes mellitus. The second is that found in nephritis. In the first type, due presumably to the incomplete oxidation of fatty acids, the ketone bodies, especially betahydroxybutyric acid, accumulate in the blood to excess. These organic acids, being stronger acids than carbonic acid, take sodium from sodium bicarbonate to convert themselves into salts. With the dissociation of the sodium bicarbonate molecule the carbon dioxide of the blood falls. In the second type there is no ketosis. Accordingly the urine fails to show acetone bodies. Due to the inability of the kidneys to eliminate normally the acid end products of metabolism, such as phosphoric and sulphuric acids, these acids are retained in the blood. In the same manner as in the acidosis of diabetes mellitus, they are converted into salts by withdrawing base from the sodium bicarbonate molecule. Likewise the carbon dioxide of the blood falls.

The normal range of plasma carbon dioxide, and that found in varying degrees of acidosis is as follows:

50 to 65	volumes	per	cent	= normal.
50 to 40	"	"	"	= slight acidosis.
40 to 30	"	"	"	= moderate acidosis.
30 to 20	"	"	"	= severe acidosis.
20 minus	"	"	"	= very severe acidosis.

The Van den Bergh Blood Test

During recent years a blood test developed by Van den Bergh for the determination of bilirubin in the blood serum has come into very general use. By it one can measure qualitatively and quantitatively the serum bilirubin. This test has shown us that bilirubin may exist in the blood in two different physico-chemical states. One is the bilirubin present when there is an obstructive type of jaundice, associated with jaundice of the skin and bile pigment in the urine. This is the so-called "finished" type of bilirubin that has been re-absorbed into the blood stream after being completely prepared for excretion into the duodenum. This type of bilirubin produces the "direct reaction." The other is the bilirubin which is derived from the

breaking down of hæmoglobin at any point in the body. This type of bilirubin has been confused with hæmatoidin but more recently the two have been shown to be identical. It circulates in the blood stream, apparently bound to colloid molecules, especially the blood proteins, and results in the "indirect" type of reaction. A considerable increase of this "indirect" type of bilirubin in the blood serum is not necessarily associated with any visible jaundice, and usually there is no detectable amount of bile pigment in the urine. Only in "crises" of rapid cell destruction is this bile pigment present in the urine. The simplicity of this test makes it of great value in differentiating between different types of hyperbilirubinæmia. Also, when repeated at intervals upon the same case, it is a much more accurate index of progress or decline of a hyperbilirubinæmia than any skin discoloration.

The Van den Bergh test is of value in the following clinical conditions:

Disease	Reactions Direct	Indirect
Jaundice—obstructive (stone—new growth—inflammation)	+	+
Infectious hepatitis (early)	—	+
Infectious hepatitis (late)	+	+
Hæmolytic jaundice	—	+
Pernicious anæmia	—	+
Purpura	—	+
Chronic cholecystitis (without obstruction of the common duct)	—	+
Liver cell degenerations (acute yellow atrophy, etc.)	—	+
Hæmorrhage into body cavities (pleural—peritoneal, etc.)	—	+

Conclusions

The employment when indicated of the above chemical tests will aid greatly in many differential diagnoses. But few single procedures in medical practice are diagnostic in themselves. They must be properly interpreted in relation to the history and other findings. Only then can blood chemical findings be intelligently employed.

INTESTINAL OBSTRUCTION*

By R. V. B. Shier, M.B. (Tor.), F.A.C.S.

Toronto

INTESTINAL obstruction still claims a very high death rate, despite the fact that the teaching of the symptoms and the terribly fatal results have been thoroughly emphasized. The surgeon accuses the physician of delay in early diagnosis and the physician accuses the surgeon of poor results, the sum total of these accusations being a very high mortality rate. To me, there are two points which tend to aggravate the difficulty. It has been taught for many years that fæcal vomiting is one of the important symptoms of intestinal obstruction and, so thoroughly has this point been impressed upon the medical profession at large, that the fact that it is a late symptom rather than an early one has been lost sight of, and that to make a diagnosis at this phase of the disease is to court disaster. The other point, which I feel has a very direct effect on this delayed diagnosis, is the fact that the patient is very much worse than he may appear to be because of an altered blood chemistry.

Intestinal obstruction may be classified as acute and sub-acute. I will not discuss all the different causes of acute intestinal obstruction, the symptomatology of all types of cases being practically the same with the one exception of intussusception in children. I think the common types of acute intestinal obstruction involving the small intestine, outside of intussusception, are those due to strangulated hernia and to bands, either congenital, or acquired as the result of a previous operation.

If an otherwise perfectly healthy individual, who gives a history of having had absolutely nothing wrong with him within a reasonable period, develops an acute intestinal obstruction, the chance of its being a small intestine involvement rather than one of the large intestine is practically 90 per cent, and the history one obtains from such a case is something as follows: Possibly years previously, or only months previously, the patient has had an

* An address delivered before the Medical Society of Halifax, May, 1927.

operation. This, indeed, is about the only fact of great importance in the history. Suddenly the patient has been seized with colicky, abdominal pains, which have been rhythmical, coming at more or less regular intervals, and, if the case is seen within the first few hours, have been steadily increasing in severity. With each exacerbation of pain there is nausea which soon leads to vomiting. The vomiting at first is that of the contents of the stomach, possibly what has been eaten at the meal previous. Water taken to relieve an uncomfortable feeling, attributed to emptiness of the stomach, is soon vomited. As the hours pass by the vomitus changes from the contents of the stomach to those of the duodenum which are of a green, bilious nature, and finally, as the distended intestine becomes filled, the vomitus becomes brownish and foul smelling. Colicky pain is, without doubt, the most constant diagnostic symptom of acute intestinal obstruction, and is the one symptom on which an early diagnosis can be made. Without colicky pain one should hesitate to diagnose a small intestinal obstruction, and delay is possibly justified until the vomiting of duodenal contents takes place; but, if colicky pain is present, there is no justification in waiting for the type of vomitus to make a diagnosis.

When we come to examine a patient who is suffering from acute intestinal obstruction, the appearance of the patient in general and the points noted on inspection of the abdomen will vary according to whether the patient is seen early or late. In making the physical examination of a patient's abdomen, one should examine always in the same way, and have an adequate exposure of the abdomen from the level of the nipples to below the symphysis. The following points should be noted: the quality of the respirations as to whether they are thoracic or abdominal; the contour of the abdomen, the presence or absence of liver dullness; the question as to whether or not the diaphragm moves to its normal excursion; the presence or absence of free fluid in the flanks; and, the presence or absence of a tumour mass. These are all very important, but we, who are in the special field of surgery, find that there are three other points, which a great number of physicians overlook; these are, a careful inspection of the hernial openings; the question of whether or not there is a urethral discharge in the male or a vaginitis in the female; and last, but not least, a rectal examination. It is astonishing how often a rectal examination is neglected in the examination of patients; this is particularly true in the case of pelvic appendicitis when a rectal examination is one of the most important procedures in making an early diagnosis.

If the patient is seen early, there will not be very much difference in his facial expression, or in the colour of his skin, or in the tone of the pulse, but, on inspection of the abdomen, with each rhythmical, colicky pain, one may be able to visualize intestinal peristalsis. This may be further demonstrated by palpation; for often one can feel the distended coil of intestine contract beneath the palm of the hand only to relax again in a few moments. If the patient is seen a few hours later, and, by a few hours, I mean within twelve to eighteen hours from the onset), there will be a distinct change from normal in his facial expression. The face will be slightly flushed with a tendency to cyanosis. The colicky pains may have passed their maximum of severity, and may not be quite so severe, the reason for this being twofold: (1) the intestine is becoming exhausted from repeated contractions, and (2) the blood chemistry has, by this time, become so altered that contractions are of poor quality. On inspection and palpation of such an abdomen, one may note distension and, if the palm of the hand is passed over the surface, (and this is particularly noticeable between the attacks of pain), one can elicit a definite splashing, this sound being elicited by a few quick motions of the fingers. This finding is certainly very diagnostic.

I said a few minutes ago that the blood chemistry in all cases such as this is markedly altered, and as it is at this stage of intestinal obstruction that the surgeon is most frequently called upon to operate he will do well to scrutinize the pathological condition closely and to secure a thorough chemical examination of the blood.

Whipple, some few years ago, performed a series of experiments in intestinal obstruction, which have been of great value to the profession and to the human race. He found that in intestinal obstruction, (and his findings were

the more evident the higher up the obstruction was in the small intestine), the blood chemistry became rapidly altered and a condition of alkalosis soon established. Alkalosis is a condition in which the non-protein nitrogen of the blood and the carbon dioxide combining power are both markedly elevated, and the blood chlorides are noticeably reduced. Possibly the word "reduced" is not the proper term because there is no increase of chlorides in the urine, but the fact remains that we are unable to demonstrate the normal quantity in the blood; if the chlorides are in the tissues or blood stream, they are in such a state that they cannot be recognized or measured as in the normal individual. We have to deal, therefore, in intestinal obstruction with an alkalosis. It is owing to this important work in blood chemistry that we have made within recent years such very important advances, not only in the diagnosis, but in the pre-operative and post-operative treatment of intestinal obstruction. The one point about this condition of alkalosis which is important is the diminution in the chlorides. It has been shown by experiments that, when the chlorides drop much below .45 grammes per 100 cubic centimeters of blood intestinal peristalsis ceases. Therefore, it is reasonable to expect that, as the hours go by in a case of intestinal obstruction, not only the bowel contractions weaken by fatigue, but they also lack the necessary stimulation of blood chloride content. This has a very important bearing on the re-establishment of peristalsis, not only before operation, but following operation.

We note then that the three outstanding diagnostic points in a moderately advanced case of acute small intestinal obstruction are: (1) rhythmical, colicky pain; (2) vomiting of stomach, duodenal and upper intestinal contents; and, (3) altered blood chemistry, a state of alkalosis.

Acute intestinal obstruction constitutes an acute abdominal emergency. One may classify acute abdominal conditions into—traumatic, infective, obstructive, perforative and, as a fifth, the "pseudo-abdomen"; the last referring to those cases of acute abdominal pain, developing occasionally as the result of the invasion of infective fevers such as typhoid, measles, scarlet fever, and smallpox; for, I am sure, few surgeons have not had the unpleasant experience of having opened an abdomen under such circumstances to find, in twenty-four hours, a well developed rash of scarlet fever, measles, or smallpox.

All these various abdominal conditions at their onset have in common pain as the one outstanding symptom. It is well to consider the types of pain. In the patient with perforated gastric or duodenal ulcer, there is, in the majority of cases, a history of intermittent disability, which has been present over a period of years. He is seized suddenly with an acute abdominal pain and, following this pain, the patient passes through three phases. For the first hour or so the pain is quite intense and the patient is in a state of collapse. The patient then improves and, some five or six hours later, is so much improved that the physician considers he has made a mistake in diagnosis. After six to eight hours more the patient passes into the third stage of peritonitis. The pain in perforation is sudden, and vomiting occurs only in 25 per cent of cases. Therefore, the diagnostic points in perforations of the stomach or duodenum are; (1) the history; (2) three stages following the sudden onset, and (3) the demonstration of free fluid in the abdominal cavity.

In acute appendicitis, the pain is at first, as a rule, colicky and commonly referred to the epigastrium or umbilicus, and nausea and vomiting are present. In the majority of cases, the pain soon localizes in the right iliac fossa.

In acute cholecystitis, there may, or may not, have been a history of previous attacks or of a constant gastric disability. The pain is severe but constant. There is definite tenderness over the gall bladder region. Vomiting is a marked feature, which may or may not give relief, relief as a rule depending on the administration of a sedative hypodermic.

Acute pancreatitis gives, by all odds, the most severe pain to which a human being can be subjected, requiring large doses of morphia to control it; there is at the same time a noted absence of rigidity of the abdominal wall. Vomiting is constant and, in the course of an hour or so, there is a definitely cyanotic tint to the face and finger tips. The abdomen is markedly tender over the pancreas, but not rigid. Acute pancreatitis resembles, more than any other condition in the abdomen, a high

intestinal obstruction and it may be exceedingly difficult to differentiate between them.

An ovarian cyst with a twisted pedicle is generally easily diagnosed by feeling bimanually, or simply through the abdominal wall, the presence of a tender globular mass. The pain is quite severe, continuous and, in the early stages, produces a certain amount of collapse.

In ruptured ectopic pregnancy, we have the history of a missed period, while the pain is of the type produced by blood in the peritoneal cavity, which gives a peculiar hypersensitiveness on palpation, and the patient, shows the signs of hæmorrhage. The leucocyte count in ruptured ectopic pregnancy is extremely high, ranging in a few hours as high as 40,000 or 50,000. If, however, the blood has been present in the abdominal cavity for some few days, the leucocyte count may come to within normal levels.

Renal colic may produce a condition very closely resembling intestinal obstruction. In this way, there may be a reflex intestinal paresis with distension, and one may have very great difficulty in getting the bowels to move with enemata. The x-ray is a very efficient means of differential diagnosis. The pain also is not of the rhythmical, colicky type of intestinal obstruction.

We now pass on to sub-acute intestinal obstruction. This is, as a rule, an obstruction transplanted on a more or less chronic obstruction and this type of obstruction practically always involves the large intestine. Carcinoma of the recto-sigmoidal section is the common cause. The patient presents himself with the history that, for some months, he has had difficulty in getting movements of the bowel. There may, or may not, have been an occasional streak of blood, but there is almost certain to have been the frequent occurrence of mucus. There may have been a fullness in the region of the rectum, or the patient may describe it as a "bearing down", or a feeling that the bowels have been ineffectually evacuated. In order to get bowel movements the patient resorts to cathartics, very commonly Epsom salts, because Epsom salts causes a watery stool, and the patient suffers little, if any, discomfort. Castor oil is sometimes used, and here I would like to state that castor oil, as a diagnostic measure in recto-sigmoidal carcinoma, is very important. I cannot state definitely the percentage, but I know that it is high, of the cases in which colicky pains have been induced by castor oil and an acute obstruction has been precipitated. If a patient comes to me with a history of loss of weight, difficulty in getting bowel movement and castor oil gives him crampy pain, I am convinced at once that the proper place for that patient is in the hospital. Let us suppose then, that a patient with a recto-sigmoidal carcinoma has entered upon the stage of subacute, or acute obstruction. There are two sites for the pain in this type. First, colicky pain in the region of the recto-sigmoid, and secondly, pain in the region of the cæcum. A great number of patients complain of this latter area and, so definite are they, that the surgeon is apt to be misled into believing that the lesion lies in the ileo-cæcal region. It is well to bear in mind that, if one is certain he is dealing with a large intestinal obstruction and can definitely rule out an acute appendix, it is very rarely that carcinoma or tuberculosis of the cæcum results in obstruction. The obstruction will practically always be found in the transverse colon, splenic flexure, descending colon, or recto-sigmoid. These are the areas which obstruct and perforate, while carcinoma of the cæcum perforates and forms an abscess, but does not obstruct. The abdomen in these cases of recto-sigmoidal obstruction is, of course, markedly distended. Vomiting does not occur early, but late, and the blood chemistry is little, if at all, altered. The diagnosis must be made entirely from the history and from the physical examination. If the case is seen before acute obstruction has taken place, some information can be obtained by a barium enema, although the results in our hands have been disappointing. A barium series in a suspected case of recto-sigmoid carcinoma should never be given, because the barium is almost certain to produce an acute obstruction. It is also well to remember that, before the administration of a barium enema, it is unwise to give a cathartic on account of the same danger that I have mentioned as occurring after the administration of castor oil.

Regarding treatment, of course it is surgical. In the acute intestinal obstruction cases, as a rule, the surgical relief is very simple, merely

a band to divide, or a hernia to release, but, in addition to this surgical relief if one wants to reduce the mortality rate, one must have a very thorough knowledge of the blood chemistry and the methods at our disposal for the re-establishing of the normal. Our rule at the Toronto General Hospital is, when the patient is admitted, the blood chemistry is at once determined. If this is markedly altered, a continuous intravenous of 10 per cent glucose in normal saline, or an interstitial of saline, is at once commenced, the stomach is washed out, and 180 grains of ammonium chloride are given per rectum. On no account must sodium bicarbonate be given to these patients. In fact, we have a standing order on our service that no case of persistent vomiting is allowed sodium bicarbonate before he has had a blood chemistry determination for it simply increases the alkalosis. In these cases the patient is operated on under a local anæsthetic, using a field block, supplemented by gas and oxygen. If the blood chemistry has been very markedly altered, that is, if the patient is in a very marked state of alkalosis, the portion of intestine above the obstruction is drained by means of a rubber tube placed in the distended loop of intestine, pointing towards the stomach, the tube being Witzeled into the bowel. This serves as a very efficient drain for the next 48 hours, at least, of highly toxic material and saves its absorption further down in the bowel, particularly the cæcum, in which event it would further increase the patient's toxæmia. The patient is returned to bed, the normal saline is continued, or, if the case is very toxic, 600 cubic centimetres of 6 per cent saline is given intravenously, while another dose of 180 grains of ammonium chloride is administered per rectum. I may say that we seldom use the 6 per cent saline, but find that the glucose saline intravenous, or an interstitial of saline, given continuously, with the repeated administration of ammonium chloride per rectum, rapidly brings the patient's blood chloride to .45 grammes per 100 cubic centimetres, after which time intestinal peristalsis is adequately re-established and drainage through the ileostomy tube is free. This administration of saline and fluids must be kept up for some two or three days, the amount being determined by the patient's state of dehydration and after repeated blood chemistry estimations. One need have no fear of keeping the patient comfortable with morphia, or morphia and codeia, provided dehydration is avoided and the blood chemistry is kept normal.

In the case of obstruction in the large bowel, that is from carcinoma, one has a slightly different problem and what I am about to say applies, not only to obstruction in these cases, but also to sub-acute obstruction. Carcinoma of the recto-sigmoid, or carcinoma of the large bowel in any portion, is certainly best handled by at least a two, or better, a three-stage operation. If we see the case when obstruction has actually taken place, one is up against the proposition of relieving the obstruction. In certain cases one could do this by means of a blind colostomy, or blind cæcostomy, but, as a general rule, it is better to verify the diagnosis through a mid-line incision and, at the same time, through a lateral opening, do either a colostomy of a cæcostomy. The removal of the sigmoid is left for resection at a later date when the patient's condition has improved by the administration of saline, blood transfusion, etc., as well as adequate cleansing of the obstructed bowel. It is always a question as to whether one should do a colostomy or a cæcostomy. If the case is inoperable, there is no doubt that a colostomy is the operation of choice, but, if the case is operable, a cæcostomy has certain advantages over a colostomy. It is much easier to close and it leaves a much cleaner field to operate through at a later date. Our difficulty with a cæcostomy, however, has always been to get it to thoroughly empty the distended portion of bowel. I am convinced that, if one decides to do a cæcostomy, one must be sure to deliver a fairly good sized portion of cæcum and place in it through a purse string a fairly large rubber tube with two lateral openings. This may be syringed at intervals after the first six hours with two or three ounces of saline, say every two hours, simply to keep the tube washed out. After a few days larger quantities may be used.

This operation of exploration and cæcostomy, or if need be colostomy, relieves the patient of his acute obstruction and, after the course of a week or ten days, enables him to overcome his toxæmia. Not only is it important in cases of

acute obstruction of the recto-sigmoid, to thoroughly drain the obstructed portion of bowel for some time but it is also important in cases of subacute obstruction. One should regard the obstruction of the intestinal tract by a recto-sigmoid carcinoma as analogous to the obstruction in the urinary tract caused by enlargement of the prostate. All the tissues of the body are poisoned, and these patients need every advantage for recovery from a major operation.

If the case is considered as unsuitable for further operation a colostomy must be determined upon. I must say that my ideas regarding colostomy have changed very much within the last two or three years. Most patients will tell you that they would prefer death to a permanent colostomy. This indeed is quite true, unless the colostomy is properly managed. If the patient is taught, on leaving hospital, to use a saline enema through the colostomy each morning after breakfast, the large bowel can be thoroughly washed out, and there will be very little leakage during the day. This saline enema may be repeated in the evening, thereby ensuring the patient a very comfortable night. After a time the bowel becomes educated to empty itself once or twice a day, a great number of patients being able to determine accurately the time of bowel movement. This method of education takes away from the patient many very disagreeable features of a colostomy.

SALYRGAN AS A DIURETIC*

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THESE observations on the action of salyrgan as a diuretic are being presented here because, up to the present, this drug has received very scant attention in our literature. It is rather surprising that this should be so, for salyrgan has been very popular among our German-speaking colleagues for several years, and is accepted by many continental clinics as the diuretic of choice.

Salyrgan was first introduced as an antiluetic mercurial agent, but its distinct diuretic activity soon led to its entrance into other therapeutic fields. Salyrgan is the sodium salt of a compound produced by the influence of mercury acetate upon salicylallylamidoacetic acid; it contains about 36 per cent of mercury, and is used in the form of a 10 per cent aqueous solution, of which one cubic centimetre contains 0.036 grm. of mercury. It is usually given deeply into the muscle, but can also be administered intravenously. The initial dose is 0.5 to 1.0 c.c., and this is increased to 2.0 or 2.5 c.c. repeated every two to five days as indicated.

Salyrgan is of most value in the treatment of cardiac œdema and of ascites arising from portal cirrhosis of the liver. In these conditions, the results reported by various workers have been most encouraging. Like novasurol (merbaphen), it has been tried in cases of inflammatory effusions, such as occur in pleurisy and tuberculous peritonitis, and it has even been used in the treatment of obesity. It has been frequently used in the chronic water-retention forms of nephritis, but, being a mercurial preparation, it is contra-indicated in acute nephritis and in the more severe chronic forms exhibiting nitrogenous retention. Of the eighteen cases studied by the writer during the last year, one showed portal cirrhosis, one had chronic parenchymatous nephritis, and the remainder suffered from cardiac œdema, complicated in several instances with hepatic changes and in one case with hæmochromatosis. A marked diuresis was obtained in every patient with one exception—to be discussed later. The urinary output rose within four to eight hours and frequently attained four to five thousand or more cubic centimetres in the twenty-four hours.

One reason for its great popularity on the

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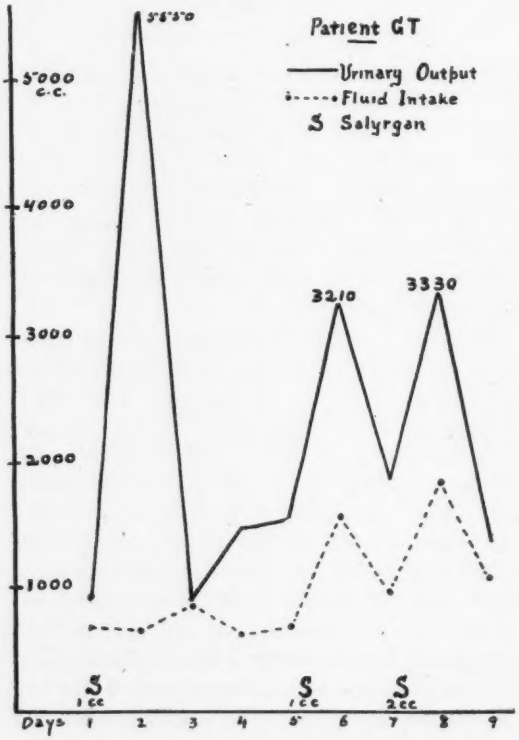
continent lies in its relative freedom from toxicity. For this reason it is there rapidly supplanting novasurol (merbaphen). Many observers have reported mercurial stomatitis, albuminuria, and hæmorrhagic colitis and cystitis following a few, or even one injection of novasurol. This has led many clinicians to administer the drug as a last resort only. Petzal,[1] for instance, observed so many reactions with novasurol that he used it with great caution, and then only after all other remedies had failed. On the other hand, he reports over one hundred patients treated with salyrgan, all with favourable results. Günsberg[2] has come to the same conclusion and draws attention to the fact that, while novasurol cannot be given more often than every seven days, salyrgan may be given two or three times per week, thus producing more rapid results. The writer, while in Vienna, observed necropsies on eight cases revealing hæmorrhagic colitis due to novasurol. No pathological condition was observed that could be attributed to salyrgan, despite the fact that the latter substance was being used in the various clinics to a much greater extent than was novasurol. Bernheim reports one thousand and Brunn seventy-five salyrgan injections without the slightest secondary reactions. Herszky[3] reports no mercurial reactions whatever. In our series of some eighteen patients, we have observed no untoward mercurial reactions. Nephritic irritation was at no time observed. One patient showed a slight urticaria following the first injection. Temporary local tenderness was, of course, fairly common. Salyrgan must be administered deeply into the muscle or intravenously—never subcutaneously. Failure to observe this precaution on the part of a junior attendant caused cutaneous sloughing in one patient (A. B.), with a considerable and natural diminution in enthusiasm on the part of that individual.

This freedom from toxicity has been strikingly illustrated in the case of a patient studied with Dr. George Glionna. A merchant (C. F.), in his forties, suffering from severe portal cirrhosis with marked ascites, had found no relief with novasurol (either with or without ammonium chloride), diuretin, nor anasarcin. From one and one-half to two gallons of fluid were being withdrawn from his abdomen twice or thrice a month. Given salyrgan, on February 23, 1927, he experienced a marked diuresis and he improved so much that he was soon able to resume his business and he has been able to come into the city nearly every day since last March. His portal obstruction is very severe and 2 c.c. every other day just keeps his weight constant and his abdomen soft. He has been taking approximately this amount ever since last February, nine months, without any albuminuria nor the slightest evidence of toxicity. To date he has had about one hundred and ten injections, totalling 204 c.c.! His daily output during this period has averaged just a few cubic centimetres short of 2,400 with maximum outputs of 4,000 c.c. and 4,200 c.c. That salyrgan has not lost its effect in this instance is evidenced by the fact that in the month of August, when the skin was unusually active, the average daily output was 2,050 c.c.

The continued efficacy of the drug was also

CHART I



Marked response to salyrgan in a male patient suffering from cardian œdema. The diuretic effect did not abate; on the 39th day, following 2 c.c. of salyrgan, he passed 4,950 c.c.; on the 55th day, he passed 4,500 c.c.

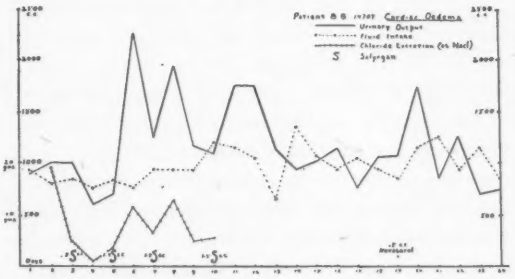
demonstrated in the patient G. T., with myocardial disease. (Chart I.) Here we obtained a diuresis of 4,950 c.c. on the forty-fifth day, and 4,500 c.c. on the sixty-fourth day after instituting this treatment.

Günsberg has observed that the diuretic action of salyrgan is quite prolonged; more so than that of novasurol. Our experience in the majority of cases has been that the diuresis is most marked during the first twelve hours and rapidly falls to normal during the second day. However, one of our patients (J. J.), suffering from myocardial degeneration and cardiac œdema, showed only a moderate diuresis of 2,300 c.c. immediately following the intramuscular injection, but this increased output continued for many days and was 2,600 c.c. on the ninth day following injection. The fluid intake was kept constant between 1,000 and 1,200 c.c. Another of our patients (M. P.), suffering from a combined cardiac and hepatic water retention, and, with an intake of less than 1,000 c.c., passed 4,680 c.c. on the first day and within an ounce of this same high figure on the second day. Prolonged diuresis is reported to be more probable with intramuscular than with intravenous administration.

The most striking results were obtained in our cardiac patients. The effect of salyrgan is well illustrated in the instance of a retired banker, studied with Dr. R. L. Morrison. He had received very little, if any, benefit from several diurétics administered. His legs were quite swollen; there was moderate ascites and he had considerable fluid in his chest. Given 1 c.c. of salyrgan, his renal output rose to 4,200 c.c. in twenty-four hours. Some urine was lost during the following day, bringing down his recorded output to 600 c.c., but with the administration of an additional 2 c.c. of salyrgan on the following day, his output again rose to 4,200 c.c. During the first four days, the patient's weight dropped from 192 to 178 pounds, a loss of fourteen pounds. Subsequent responses were not so copious, possibly because the œdema was much less. The hydrothorax was unaffected and on the eleventh day 2,100 c.c. was removed by thoracentesis. This relieved his respiratory embarrassment and the improved cardiac action may explain why the two succeeding doses elicited responses of 3,950 c.c. and 2,700 c.c. His weight on the twentieth day was 157 pounds, a loss of thirty-five pounds.

Patient (B. B.), a girl of twenty-three, ran a very interesting course. (Chart II.) She

CHART II



Severe case of cardiac œdema in a young woman. One-half c.c. of salyrgan was inadequate to affect the failing excretion. Doses of 1.5 c.c. produced the desired effect with considerable improvement. The salt excretion maintained a constant ratio to the water excretion. One-half c.c. of novasurol produced a diuresis, but was followed by mercurial intoxication.

had a severe mitral stenosis and aortic regurgitation of rheumatic origin, resulting in a tremendous enlargement of the liver, the lower margin in the midclavicular line being 13 cm. below the costal margin. Digitalis and diuretin failed to produce a diuresis—so did one-half c.c. of salyrgan. Her condition was very serious, her output dropping from 1,000 c.c. to 600 c.c. One and one-half c.c. of salyrgan produced a diuresis of 2,250 c.c. followed by a noticeable improvement in her condition. Three injections were given with good results. The general œdema was gone and the ascites was definitely less. After nine days' further observation one-half c.c. novasurol was given as a control. The diuresis was about equal to that of the last salyrgan injection (1,720 c.c.), but following this small dose of novasurol she developed a marked gingivitis and had diarrhœa for several days. We did not dare to repeat it for further comparison between the action of the two drugs.

Another patient, (G. C.), aged 51, suffering from severe cardiac decompensation and also

Intake		*Output*
1. 400 c.c.		180 c.c.
2. 550		540
3. 300	(1 c.c. salyrgan)	1050
4. 450		1140
5. 600	(2 c.c. salyrgan)	2730
6. 300		4470
7. 300		2070
8. 300	(2 c.c. salyrgan)	2940
9. 720		2730

portal cirrhosis showed the above very satisfactory result.

During this period his weight dropped from 220 to 186¾ pounds, a loss of 33¼ pounds.

Salyrgan is less efficacious in terminal anasarca. I saw a young woman thirty-six hours before death with a severe heart lesion, tremendous œdema and ascites, and a history of having passed less than 200 c.c. urine in the previous twenty-four hours. Two c.c. of salyrgan, injected intramuscularly, produced a diuresis during the following day of only 1,800 c.c., an improvement, to be sure, but later the mortician withdrew over two gallons of ascitic fluid.

The one patient in whom we did not obtain any tangible result was a sailor (J. S.), with an acute pancarditis resulting in signs of marked decompensation. Three bidaily injections of 1 c.c. and one of 2 c.c. salyrgan did not raise his output above 1,000 c.c., approximately equal to his intake. (In view of the water loss by skin, lung and bowel, this must mean some diuresis at least). Sixty grains of ammonium chloride given daily with and following the last two doses of salyrgan had no additional effect. Just before death this patient developed a marked purpura with hæmaturia. We thought at first that this might be a mercury reaction, but its widespread nature and its intensity pointed to a terminal general dissemination of the toxic agents responsible for his ulcerative endocarditis.

We have not been able to obtain a complete loss of œdema in every case. In several instances the salyrgan has rapidly reduced the œdema or the ascites to a minimal quantity, which would then persist despite further injections. On this account, one would hesitate to rely upon the diuresis as a means of diagnosing latent œdema, a procedure suggested by Herszky. Nor are we convinced that it will reduce pleural effusions, as has been claimed. Truly, one patient with a marked hydrothorax from cardiac decompensation did lose nearly all of this fluid, as determined by physical signs, but several other cases showing pleural effusion or pleural transudate, did not show any decrease in amount, even though the general œdema went down. On one of these patients, chest taps, while still necessary, did not need to be performed as frequently as before the administration of salyrgan.

In three cases of cardiac œdema, a tabulation of the chloride excretion before and after salyrgan administration shows that, while the total chloride excretion is increased by salyrgan, the percentage in the urine remains fairly constant. We have also observed in these cases that the total amount of urea in the urine is affected very little, the percentage dropping with increased diuresis. The fact that the loss of body weight is often greater than the urinary output has led Rosenberg[4] to suggest that there may be a simultaneous increase of the perspiration.

The addition of ammonium chloride, as recommended by Jacobs and Keith,[5] enabled us to increase the output by 20 per cent in the patient suffering from portal cirrhosis. The addition of ammonium chloride to the salyrgan in two cases of cardiac œdema did not elicit any additional response. Judgment on this point must be reserved for a larger series, as several factors might bear on these observations. One patient, suffering from chronic parenchymatous nephritis with considerable œdema, did very well on ammonium chloride alone. The combination with salyrgan produced practically the same diuresis.

Conclusions

1. Salyrgan is one of the most potent diuretics available at the present time.
2. It is comparatively harmless.
3. It is of most value in cases of cardiac decompensation with œdema, and in portal cirrhosis of the liver.
4. It should not be administered in acute nephritis and only with caution in chronic nephritis.
5. It cannot be depended upon to remove pleural effusion nor transudate.
6. It exerts a diminished influence when the anasarca is terminal.

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OXYGEN THERAPY IN PNEUMONIA*

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Toronto

THE therapeutic use of oxygen goes back a great many years, almost to the days of Priestley and Lavoisier, who first prepared the gas, and showed that it is the vital principle of air. Just on account of its being such a vital principle it was used at first in all manner of diseases, with the hope that it would have the same stimulating effect in the body as it has in such chemical reactions as combustion. As the physiology of respiration and circulation became better known, the use of oxygen was put on a more rational basis, and was restricted to disturbances of respiration and circulation. The need for oxygen in these conditions was obvious, but the methods of administration were so inefficient, and usually still are even at the present day, that the results hoped for were not obtained, and this form of therapy fell into more or less disrepute. It seems to have been reserved largely for the last hours of patients dying of pneumonia, and was given then more for the sake of feeling that everything possible was being done than with any hope of saving life. At that stage in the disease, and administered in the way it usually was, oxygen had no more effect than the hypodermics of strychnine given under similar circumstances.

The reason for this unfortunate situation in regard to oxygen therapy has been the difficulty of checking up scientifically the actual effect of oxygen in the body after inhalation by the patient. In recent years some of this difficulty has been cleared up by the work of Huerter, Van Slyke, Haldane, and others, in their investigations on arterial blood in normal and in diseased individuals. Previous to this there had been no means of ascertaining whether or not the oxygen content of the blood leaving the lungs was in reality being increased by the oxygen inhaled. Fraser, at St. Bartholomew's Hospital, has further simplified these investigations by showing that it is easy and safe to obtain blood samples by puncture of the femoral artery just below the inguinal ligament.

Lack of oxygen in the body tissues may be due to one or more of several causes:—

1. There may be too little oxygen in the air, as at the great altitudes found in mountain climbing and flying.

2. There may be too little hæmoglobin available, as in anæmia and in poisoning by carbon monoxide.

3. There may be failure of circulation, as in heart disease, when the blood flow is too slow to keep up an adequate supply of oxygen to the tissues.

In the types of cases exemplified by anæmia and heart failure the administration of oxygen will do no good. The lung is the only place where oxygen can enter the blood stream, and in these conditions the blood leaving the lungs is already carrying practically its full load. Increasing the amount of oxygen in the inspired air in these cases can only increase the amount of oxygen in the blood by forcing a little more of the gas into simple solution in the plasma.

4. Lastly, anoxæmia may be due to abnormalities in the lung, preventing the blood from getting its proper supply of oxygen from the inspired air. Examples of such abnormalities are infarct, œdema, and pneumonia. In these cases the circulation is adequate, or almost so, but the state of the alveoli interferes with the transfer of gases between blood and air. It would seem reasonable to suppose that if the oxygen in the alveolar air were increased it would be easier for the blood to become fully saturated in the short time it spends in the pulmonary circulation.

Normally, blood leaves the lungs about 95 per cent saturated with oxygen. In severe cases of pneumonia the arterial saturation may sink below 80 per cent, or sometimes even below 70 per cent. There is considerable evidence to suggest that such a lack of oxygen may in itself be the cause of some of the more severe symp-

* Read at the Section of Medicine, Academy of Medicine, Toronto, Tuesday, Nov. 8, 1927.

toms and dangers of pneumonia. As an example of such evidence, it was a common observation during the war that aviators returning from particularly high patrols, even those during which there had been no special strain or fighting, were irritable and confused. Again, Barcroft shut himself in an air-tight chamber in which the oxygen was sufficiently reduced to cause his arterial saturation to sink from the normal 95 per cent to 88 per cent. This is a very mild degree of anoxæmia, but was enough to cause in him such symptoms as vomiting, vertigo, severe headache, and increased pulse rate. These results were confirmed by Haldane and others in similar experiments. Another example of the effects of anoxæmia is carbon monoxide poisoning. In severe cases, although the oxygen content of the blood may be restored to normal within a couple of hours, there may already be so much damage done to the central nervous system that the patient does not recover. He may live for several days, unconscious all the time, and sometimes showing epileptiform twitchings.

There is then little doubt that anoxæmia may be one of the serious factors of pneumonia, and that the administration of oxygen should be of value. The method of administration is, however, important. There is no doubt that the worst method is the one in most common use, *i.e.*, a tube connecting an oxygen tank with a funnel held loosely over the patient's face. For all the actual effect this has on the blood the funnel might almost as well be hanging out of the window. There are three other methods in use, all very much better. The first is the nasal tube, the second is the Haldane mask, and the third is the oxygen chamber. Oxygen chambers used in different places vary in size from a small tent which just covers the patient's head, to a room-sized cabinet. This method is very efficient as regards getting oxygen into the lungs, and has the great advantage of having no attachments to annoy the patient or embarrass his breathing. It has, however, several draw-backs. It is not easily available in the home. It tends to be hot. It is not easy to get at the patient to feed, or sponge him, or to apply mustard plasters. However, where oxygen chambers are in use the results reported have been very good. The Haldane mask, or one of the various modifications of it that have been devised since the war, is also very efficient. It is free from most of the drawbacks of the chamber method. The difficulty is that the patient who is really ill, and who needs it most, usually refuses to wear it. Even a normal person requires a little practice before feeling quite comfortable in any type of gas-mask. When there is any dyspnœa, as in the pneumonic patient, or in the healthy individual after exercise, a mask is usually intolerable. One can force the patient to wear it, as is sometimes done, but it is doubtful whether its value is not more than offset by the struggles against it.

The remaining method is by the nasal tube, and taken all around it is, perhaps, the best for general use. It is not quite so efficient as either the chamber or the mask, but it is free from their disadvantages. It is rarely objected to by any patient, and is cheap and easy to set up anywhere. It consists simply of a long rubber tube leading from an oxygen tank and ending in a soft rubber catheter. This catheter is lubricated with vaseline, or better still with cocaine ointment, and is pushed back through the nostril to within half an inch of the posterior wall of the nasopharynx. In the average adult this point will be three inches from the tip of the nose. A strip of adhesive tape will fix the tube to the cheek so that it is not so likely to be inadvertently pulled out. It is an improvement to bubble the oxygen through hot water on its way to the patient. This warms the gas and saturates it with water vapour, doing away with the tendency to dry the throat, which is otherwise an annoying feature. Another improvement is the use of the headband suggested by Geoffrey Bourne in the *Lancet* of July 1, 1922. This holds the catheter more securely than adhesive plaster, and is more comfortable for the patient. The most common fault with this nasal tube method is in not giving the oxygen fast enough. The usual rate of five to ten bubbles a second from a half-centimetre tube amounts to less than a half litre of oxygen a minute. This is not enough to have any appreciable effect on the alveolar air. Most individuals can tolerate about four litres per minute. When no meter is supplied with the oxygen tank, the easiest rule is simply to have as high a rate of flow as the patient can bear. It does not matter whether he breathes through nose or mouth, as the oxygen

is being delivered from the tube at the point where nose and mouth meet.

In the course of some unpublished experiments at St. Bartholomew's Hospital, Hilton has found that at four litres per minute by the nasal tube the oxygen tension in the alveolar air is raised to 31 per cent or 240 mms.; about two and one-half times the normal amount. The same observer found that six litres per minute by the Haldane mask raises the alveolar tension to 650 mms., not very far from pure oxygen. Whether such extreme concentration is desirable is not certain. Some animals, such as canaries, can live apparently normal lives in pure oxygen, but Karsner working at the Carnegie Institute in Boston, found that in rabbits breathing over 80 per cent oxygen for upwards of three days there were definite inflammatory changes in the lungs.

In a few cases treated by the writer at St. Bartholomew's Hospital, and at the Toronto General Hospital, by the nasal tube method, the changes in the oxygen content of the arterial blood were as follows:

				ARTERIAL SATURATION	
				Before	*After*
No.	*Date*	*Diagnosis*		*Oxygen*	*Oxygen*
1	4/10/24	heart failure;	Recovered	86%	91%
2	21/4/25	" "	"	89	92
3	4/11/24	pneumonia;	"	81	89
4	7/11/24	"	Died 26 hrs. later	72	78
5	13/1/25	"	Died 2 days later	72	84
6	28/1/25	"	Recovered	86	92
7	23/2/25	"	"	78	86
8	2/3/25	"	Died 10 hrs. later	73.5	73
9	24/4/26	"	Recovered	90	91
10	12/4/26	"	"	84	89
11	19/4/26	"	Died 20 hrs. later	58	56
12	8/5/26	"	Died 18 hrs. later	67	62
13	8/5/26	"	Died 36 hrs. later	59	71

The two cases of heart failure had marked passive congestion of the lungs and were deeply cyanosed. The cyanosis was relieved by the oxygen, only in so far as it was due to the œdema of the lungs. The greater part of it was caused by stagnation of the blood in the peripheral vessels, and this of course remained unchanged. It is however probable that the improvement in the oxygenation of the blood in the lungs might help the general circulation.

The other cases were all of pneumonia. No conclusions can be drawn from this series as to the ultimate therapeutic effect of oxygen, as these patients were all exceedingly ill, and some of them moribund, when the treatment was started. Three cases, Nos. 8, 11, and 12, all moribund, and all with a very marked degree of anoxæmia, failed to show any improvement in the blood. In all the remainder the anoxæmia was at least partially relieved. Subjective improvement was hard to judge. Several of the cases volunteered the statement that they felt better, but most were rather noncommittal. It cannot be said whether or not any of the survivors owed their lives to the oxygen, but it is at least very possible. There are in fact no figures available anywhere to show the effect of oxygen therapy on the mortality of pneumonia. To be of any value such figures would have to cover long series of unselected cases in whom this type of treatment was made a routine.

A word as to the cost of such treatment may be of interest. The nasal tube outfit costs practically nothing, and requires no attention that cannot be given by the most unskilled nurse or relative. The cost of the chamber or mask varies with the different types, but is not high when compared with the cost of other items of hospital apparatus. As the demand for this equipment increases it may be that the medical supply houses will keep them in stock and rent them as required. Commercial oxygen, which is practically chemically pure and is perfectly satisfactory, costs about two cents a cubic foot. Used continuously at four litres a minute this would amount to a little over four dollars a day. In the average case of pneumonia, in which the administration was started early and continued throughout the acute stage the total cost would vary from fifteen dollars upwards.

In summing up the use of oxygen in pneumonia the chief points are as follows:—

1. There is both theoretical and experimental evidence that the administration of oxygen in pneumonia should be of value. What little clinical evidence is available supports this.

2. The treatment should be started early, before the anoxæmia, which frequently occurs in severe cases, injures the central nervous system. Cyanosis is not marked until the saturation is well below 80 per cent, and by this time irreparable damage may be done.

3. The administration must be done efficiently.

INTRAVENOUS GLUCOSE IN THE TREATMENT OF PNEUMONIA

By Ralph Lynch, B.Sc., M.D., Pittsburgh, Pa. and Bruce Webster, M.D., C.M., Montreal

From the Clinic of Dr. C. P. Howard, Montreal General Hospital, Montreal

THE action of glucose on the toxic heart has been studied experimentally by Edmunds and Cooper.[1] These workers produced a severe myocarditis in dogs by the injection of repeated, ascending, doses of diphtheria toxin. When the dogs were in various stages of toxicity, digitalis, caffein, and other cardiac stimulants were exhibited, and observations were made upon the effectiveness of the different drugs. Intravenous glucose, they found, could be relied upon when all other drugs had failed. To quote Edmunds and Cooper directly, "In many cases glucose was practically life-saving. If we could get the solution into the veins before the heart stopped, we were certain to save the life of the dog." There is, therefore, experimental evidence that intravenous glucose can favourably influence the toxic heart.

In attempting to apply this experimental knowledge to a clinical condition, we selected pneumonia as a disease upon which such a study could be made. Pneumonia, we thought, was peculiarly suitable for an experiment of this kind, for it is a toxic condition, and one in which the toxicity seriously involves the heart muscle. And it is not unreasonable to suppose that if glucose is effective in the toxic myocarditis of diphtheria, it might also be of value in the toxic myocarditis of pneumonia.

Apart from its value as a detoxifying agent, it is rational to regard glucose as a source of energy in pneumonia. DuBois[2] states that the basal metabolism in pneumonia is increased from 20 to 50 per cent. Certainly some attempt should be made to meet this increase. Although we have no actual evidence as to whether or not resistance to infection is diminished, we cannot help believing that weakness due to partial or complete starvation is a definite menace. In giving glucose, either intravenously or by mouth, we are supplying nutrition to an overtaxed heart muscle in the most readily assimilable form. In a patient seriously ill with pneumonia, it is neither easy nor wise to force feeding to the extent of meeting the total caloric requirements. Nevertheless, an attempt should be made to meet these as far as is consistent with the patient's comfort. Meakins,[3] in a recent article, says, "I am convinced that in pneumonia, for the prevention of cardiac failure, it is essential to maintain the carbohydrate and glycogen reserves by the intake of relatively large amounts of glucose. This is accomplished by the administration of copious quantities of fluid and carbohydrate, intravenously if necessary, early in the disease, and not when the patient is *in extremis*."

In a clinical study of a disease as variable as pneumonia, adequate controls are almost impossible. To put all pneumonias on glucose, and to compare the mortality with that of a former year, would be obviously inadequate. No method seemed ideal to us. We decided, however, to consider every other case as a control; that is, the first pneumonia admitted, regardless of the severity or mildness of the disease would get glucose; the next case admitted would not receive glucose, but would be given digitalis, both by hypodermic injection and by mouth. The glucose series received no digitalis whatever. Other factors, such as nursing, general management, etc., were kept constant for the two groups.

Twenty-two cases were studied under this ruling. Eleven received glucose and eleven received digitalis. In a series so small as this it is not surprising that more "seriously ill" patients fall into one group than into the other. If there had been several hundred cases, the "very ill" or "moribund" cases might have balanced in the two groups. As it was, more cases with a grave prognosis fell into the digitalis group. Some features of the two groups of cases have been outlined for comparison:

	Glucose Series	*Digitalis Series*
Lobar pneumonia	10	9
Broncho-pneumonia	1	2
The types were as follows:		
Type I	0	1
Type II	3	2
Type III	0	1
Type IV	4	3
Not typed	4	4
Positive blood culture	1	3
Negative blood culture	9	8
Blood culture not done	1	0
The cases were classified as follows:		
Mild	4	4
Severe	4	2
Very grave	3	5
Delirium tremens	3	0
Followed by empyema	0	2

Method

As soon as the diagnosis had been established, the patients in the glucose series were given an intravenous injection of 250 c.c. of warm 20 per cent glucose-saline solution. The concentrated solution was chosen with a view to putting the least possible strain on the circulatory system of a patient already cyanosed and congested. This injection was given daily in the mild cases and twice daily in the severe ones. It was continued until twenty-four hours after the crisis. We used a gravity system entirely, and took at least fifteen minutes to administer the two hundred and fifty c.c. of solution.

The patients in the glucose series were put on a diet of 3600 calories, made up largely of glucose combined with lime, lemon, or orange in the form of a drink. Meat broths supplied the protein and fat.

In the digitalis series, an attempt was made to secure digitalization as soon after admission as possible. They were started immediately on a course of digitalein, a hypodermic injection of 1/50 gr. being given every four hours for six doses. This was done in an attempt to get the digitalis effect at the earliest possible moment. At the same time they were given tr. digitalis by mouth. The usual dose was twenty minims every four hours for six doses, though this was varied according to the weight of the patient. Once the digitalis effect was obtained, the patients were given enough, either by hypodermic or by mouth, to maintain it. Burrage and White,[4] in a recent article emphasize the fact that if digitalis is to be of any use in pneumonia it must be given in digitalizing amounts.

Results

In the glucose group there were nine recoveries and two deaths. Mortality, 18.1 per cent.

In the digitalis group there were seven recoveries and four deaths. Mortality, 36.3 per cent.

Discussion

In a series as small as this, no conclusion, however guarded, can be drawn from the mortality figures. Clinically, however, we felt that in two instances the glucose might have been instrumental in saving life. Both of these cases were alcoholics in the throes of delirium tremens, and, in the opinion of the consulting physician, they were practically moribund.

It must be said, however, that a very ill patient in the digitalis group, who was also given the gravest possible prognosis, surprised us by making a recovery. Hence, it is evident that there is little to support our impression of the life-saving effect of glucose.

One of us (R. L.), working with W. W. G. Maclachlan in Pittsburgh, used intravenous glucose in all the more toxic cases of pneumonia seen in the wards of Mercy Hospital. Maclachlan[5] was convinced that this therapy was of considerable value, but as it was used in only the most severe cases, a comparison of mortality figures was not possible. In the Pittsburgh cases there were a number of chills and reactions, more or less serious, following the intravenous medication. In the present series there was not a single reaction of any kind in the entire group.

Further controlled studies of the action of glucose in pneumonia should be undertaken. If it is found to be of value, it should be more generally employed. If it does not definitely influence the death rate, it should be abandoned, for intravenous glucose is a complicated therapy, and one not without considerable risk.

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THE RELATION OF SINUS INFECTIONS TO RESPIRATORY DISEASE

By R. W. Knight, M.D.

Brantford

ALTHOUGH this subject rightly belongs to the rhinologist and the internist, nevertheless, the information supplied by the roentgenologist has played a part of paramount importance in establishing a kindred relation between these two separate and distinct diseases. Furthermore, it has undoubtedly proved in many instances that certain lung conditions which previously were clinically classified as tuberculous are now regarded as of non-tuberculous origin, and recent research has placed the etiological cause for this type of broncho-pulmonary infection in diseased nasal accessory sinuses.

It has been known for a number of years that disease in the paranasal sinuses has been a contributing factor in the causation and continuance of chronic infectious arthritis, fibrositis, myositis, and their allied conditions, but only lately has any suspicion been cast on this same focus as the possible source for certain non-specific pulmonary lesions. Reist and Sargeant, during the war, were the first observers to report that many soldiers, complaining of marked pulmonary symptoms and presenting physical signs which greatly simulated pulmonary tuberculosis, were at the same time suffering from some form of sinus disease. In many of these cases, repeated sputum examinations failed to disclose the tubercle bacillus as the causative organism. They noticed, however, that a marked amelioration of the lung symptoms was obtained after a careful and thorough treatment of the sinus trouble. In 1921, Webb and Gilbert published a paper corroborating the observation of the above-mentioned investigators, but in their paper they stressed the importance of bilateral empyema of the maxillary sinuses as being more frequently encountered in these cases. The cause of bronchial asthma, with its protean manifestations, was first attributed to some intranasal pathology by Voltini in 1871, and he reported a cure of two cases following a complete removal of nasal polypi. Wasson has just recently reported the frequent occurrence of sinus infection in debilitated children, associated with peribronchial infection, as a sequence of one of the infectious diseases, particularly whooping-cough and measles. Besides these two diseases there is the respiratory type of influenza, which is an etiological factor in the production of sinus infection, and many patients can date the commencement of their illness as subsequent to an attack of this disease. It has been reported by other writers that the most typical cases of chronic sinus infection in adults are pathological sequences of the acute forms occurring in childhood, but our own observations do not altogether substantiate this statement. We have seen a number of patients in our clinic who have stated that their lung symptoms began and have persisted since an influenzal attack during the epidemic of 1918-19, and that prior to that time their clinical history would in no way suggest any evidence of sinus infection.

The consensus of opinion regarding the cause of acute sinus infection finds it to be a direct extension of disease-processes that have their inception in the nose and teeth. When an acute inflammatory process, extending from either of these points, involves the nasal accessory sinuses, complete recovery occurs unless there are definite causes in the nasal cavity prolonging the infection. There is practically no tendency to chronicity in a normal sinus, but if there are structural changes within the nose, such as hypertrophied turbinates, a deviated septum, or an œdema of the nasal mucosa, an occlusion of the ostia of the sinuses results, preventing their proper drainage and ventilation, and eventually leading to chronic manifestations of the disease. These pathological changes in the nasal chamber can be definitely demonstrated on a roentgenogram, and their discovery has an important bearing on the diagnosis of the condition of the sinuses. There-

fore, it is necessary to take into consideration the entire related area, if a satisfactory x-ray opinion is to be given.

Infection of the sinuses may be present in any of the following four stages: acute sinusitis, acute purulent sinusitis, chronic purulent sinusitis, and chronic diffuse polypoid or hyperplastic sinusitis. If the acute inflammatory type fails to recover, which is usually due to the presence of some intranasal obstruction, there is a tendency to progress to the other stages in the foregoing order. Up to the chronic purulent stage there seems to be very little tendency to involvement of the respiratory tract, except as a concomitant entity. If, however, the proper treatment is not instituted at this stage the infection becomes attenuated, producing a marked thickening of the lining mucous membrane due to pyogenic invasion, and finally resulting in the chronic polypoid or hyperplastic form of the disease. A sharp distinction should now be drawn between chronic polypoid sinusitis and nasal polypi, which are secondary to the chronic purulent type. The former condition is a degenerative process of the mucous membrane lining the sinus cavity, while the latter is a type of new growth in the form of a fibromyxoma originating from the nasal mucous membrane, usually in the vicinity of the middle turbinate. There is almost no drainage from the sinuses during the hyperplastic stage, but, instead, there is a continual obsorption of bacterial products into the lymphatics. The experimental work of Mullin and Ryder has shown that a continuous drainage through the lymphatics leads eventually to the upper mediastinum, producing a chronic peribronchial glandular enlargement. They have demonstrated that the lymphatic drainage from the sinuses passes first to the submaxillaries, then to the internal jugular and the entire chain of deep cervical nodes, including the retropharyngeal nodes, and finally to the bronchial and mediastinal glands. The anatomical relations of the last-mentioned glands have been well worked out by Delamare, who classifies them into three groups, namely: peritracheobronchial, intertracheobronchial, and interbronchial. From this glandular arrangement it is easy to understand how infection of these glands may permeate the contiguous lung-structures, and set up chronic inflammatory changes resulting in a production of an exudative material within the finer bronchioles. An enlargement of these same glands, causing extrabronchial pressure and subsequent retention of secretions in the bronchi, also adds to the production of a chronic harassing cough, which is a predominant symptom in this type of pulmonary disease. Another theory that has been advanced to explain the spread of infection from the sinuses to the lower part of the respiratory tract deals with direct inhalation of infective material draining from the sinuses into the trachea, bronchi, and terminal bronchioles, setting up an infective process directly on the bronchial mucous membrane, with resultant broncho-pulmonary infection. Although direct inhalation may play a part in the causation of the infection in those cases which have discharges continually or intermittently emanating from the sinuses, yet it is hardly conceivable that it is altogether the main factor, since in a number of cases the ostia of the sinuses become completely occluded preventing the escape of the contents. It is true that several patients give a definite history of nasal catarrh and posterior nasal droppings, but there are just as many who do not give any clinical signs of sinus infection, their chief complaint being entirely referable to the lungs.

The diagnosis of the acute inflammatory and acute purulent types of sinus disease is often very difficult to make from an x-ray film, as the exudates retained in the sinuses do not as a rule leave any appreciable shadow. In exceptional cases, however, a diffuse shadow of increased density, which apparently is attributed to the exudates of an acute infection, especially in the antra, is recognized and unmistakable. Fortunately, the rhinologist does not usually need the help of the roentgenologist to make a diagnosis of an acute sinusitis, as the clinical findings are so much in evidence that it is made with comparative ease and certainty. Nevertheless, the roentgenologist can often demonstrate some structural change in the nose that is apt to favour chronicity, which may be overlooked by the rhinologist, and in this way be of some assistance to him. In chronic purulent sinusitis, the x-ray findings are those of an osteoplastic process which involves the adjacent portion of the nose as well as the corresponding cavities. There appears an increase in density or diffuse haziness, which is apparently due

mainly to a thickening of the anterior and posterior walls, the retained secretions playing a minor part, except in the case of the antra, where a larger exudate may contribute to the shadow. This condition is also usually unilateral, so that there is a distinct contrast between the affected and unaffected sides. The corresponding portions of the nasal cavity partake of the sclerosis, often with considerable deformity of the nasal fossæ, and usually with an increase in the size, thickness, and density of the turbinates. There is a marked contrast between the roentgenological appearance of chronic purulent sinusitis and chronic diffuse polypoid sinusitis. In the latter, the main features are those of an osteoporosis of the bony walls with replacement of the air within the sinuses by an overgrowth of mucous membrane. The result is a diffuse hazy plate showing the more conspicuous structures of the nose. The upper nasal passages, especially the upper middle fossæ, appear completely occluded, while the width of the lower nasal fossa is increased, due simply to atrophy of the bony and soft tissue element of the inferior turbinates. It is very interesting to note that often when a roentgenologist reports some pathology in the sinus, the rhinologist is unable to get anything of importance from irrigation of the cavity. Law has given a very comprehensive paper in regard to "Errors in the x-ray interpretation of lesions of the sinuses" in the April number, 1923, of the *American Journal of Roentgenology*.

The roentgenological appearance of the chest in the non-tuberculous inflammatory condition, *i.e.*, chronic bronchitis, shows a fine string-like shadow along the course of the main bronchi. These shadows radiate outward from each hilum, but do not reach the periphery of the lungs. Their density varies according to the degree of congestion present. There is the infiltrative type, which is characterized by a definite peribronchial thickening, usually localized in the lower lobes, the shadows even extending to the domes of the diaphragm, and commonly obliterating the costo-phrenic angle. Occasionally, in the more extensive infiltrative types, the upper bronchial tree shows invasion with the shadows radiating upward toward the clavicles, but the apices remain clear. In the advanced stages of chronic bronchitis there appear small cavitations, caused by dilated bronchioles, which are surrounded by a peribronchial infiltration. The sacculated, or bronchiectatic, stage is characterized by multiple, large cavitations, which appear as ring-like shadows and separated by very dense fibrous tissue. Usually, along the course of the descending bronchi a definite enlargement of the interbronchial glands can be seen.

The types of non-specific pulmonary disease, for which infection in the paranasal sinuses seems to be directly or indirectly responsible, are four in number. They are: (1) acute bronchitis; (2) chronic bronchitis; (3) bronchiectasis; (4) bronchial asthma.

Acute Bronchitis.—With every acute sinusitis there is invariably a more or less associated rhinitis and laryngo-pharyngitis. Many cases, however, show a more extensive involvement of the respiratory tract, even the trachea and bronchi becoming affected. Though involvement of the bronchi is generally considered a mere coincidence of an acute sinusitis, and is probably due to direct continuity from an existing tracheitis, yet, the possibility of lymphatic extension should not be forgotten, as I have noticed on several occasions a subsidence of the bronchitis even when attention has been directed only to the sinus trouble.

Chronic Bronchitis.—A history of recurring colds in children usually leads the physician to suspect adenoids and the tonsils as the causative factor, while disease in the sinuses as a possible focus is generally forgotten. Even after the enucleation of the tonsils and the curettement of the adenoids in many of these cases, the cough persists and the tendency to recurrent chest-colds goes on unabated. The frequent and protracted chest-colds in these cases are usually the result of a continual flooding of the lymph-channels with infectious material from the sinuses, producing a chronic peribronchitis, which in turn eventually develops into a definite chronic bronchitis. In those cases where a radiogram of the lungs has demonstrated only a marked peribronchial infiltration with very little dilatation of the bronchi, we have found the chronic purulent form of sinusitis to be more frequently present.

Bronchiectasis.—Since this condition is only the advanced stage of a chronic bronchitis that has been present for some time, yet it is so important that it should be considered separately. Before attributing the cause for bronchiectasis

to disease in the accessory sinuses, it would be well to exclude other common etiological causes for this disease, such as: (a) lung abscess; (b) foreign bodies; and (c) fibroid phthisis. This affection is clinically characterized by the expectoration of a thick, foul-smelling, muco-purulent sputum, which collects in the saccules of the dilated bronchioles. It is generally bilateral and it must be remembered that when it has become well established it is permanent. The chronic hyperplastic type of sinusitis is most frequently encountered in these cases.

Bronchial Asthma.—An elaborate classification of the etiology of bronchial asthma has been carefully compiled, and although each cause should be duly considered, yet it is not infrequent to find cases that have definite disease in one or two sinuses which, to my mind, should receive strict attention. The chronic hyperplastic type of ethmoiditis, in which large polypi are found to be present causing nasal obstruction, is a frequent finding in this affection. It would seem, therefore, important to correct such trouble, if found, before a good result could be expected.

In conclusion, I would like to leave with every roentgenologist the importance of urging an investigation of the sinuses in those cases whose chest plates have demonstrated a definite non-specific inflammatory lesion of the lungs. It is gradually becoming common knowledge to read roentgenological reports on chest-plates, such as the following: "This chest is negative for tuberculosis, but is suggestive of infection of the upper respiratory tract, and disease in the nasal accessory sinuses should be excluded." The general practitioner, the internist, and the pædiatrician, who come in contact almost daily with these cases, should always keep in mind the relation of sinus-infection to lower respiratory disease, so that an early recognition of the trouble might be ascertained and the proper treatment instituted before permanent damage results. If there is mutual co-operation between these men and the roentgenologist and rhinologist, the frequency of these chronic types of broncho-pulmonary infection can be greatly diminished and much suffering prevented. It should be remembered also that every chronic chest condition is not always a sequel to a chronic sinusitis, but, on the other hand, the latter should be considered only as one of the etiological factors in the causation of chronic non-specific broncho-pulmonary disease, and not as a panacea for the treatment of every chest ailment, so that this newer knowledge may be prevented from falling into disrepute and eventually forgotten.

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Diagnosis of Subacute Bacterial Endocarditis.—L. M. Hurxthal reviews the histories of 65 consecutive cases of subacute bacterial endocarditis from the point of view of differential diagnosis. He found that pulmonary signs and symptoms occurred in over 75 per cent, and he suggests that this may be due to the lodging of emboli in the nutrient bronchial arteries, and gross infarction of the lung having its origin in the right side of the heart. Clubbing was rarely found in these cases in the absence of a palpable spleen. Hurxthal thinks that although positive heart findings are suggestive, their absence should not rule out the possibility of endocarditis; acute or chronic pericarditis was found in 25 per cent of cases which came to necropsy. Precordial pain was usually associated with an aortic lesion. In all the cases the cardiac rhythm was normal. In most cases it would appear possible to distinguish between true chronic glomerulo-nephritis and the embolic nephritis of bacterial endocarditis, the excessive hypertension of the former being seldom present in the latter. The presence of fever, embolic manifestations, and macrophages in the blood, with a valvular lesion, clubbing of the fingers, or splenomegaly, warrants a positive diagnosis. The most characteristic finding in the central nervous system was a high white cell count without recovery of bacteria from the cerebro-spinal fluid — an aseptic meningitis. Summarizing the blood findings, Hurxthal considers the presence of macrophages pathognomonic of bacterial endocarditis, while one or two large mononuclear cells with an ingested red cell, and their increase with or without vacuolization, suggest this as the diagnosis. He adds that failure to relieve the pain in the extremities with salicylates in acute arthritis with a rheumatic heart should lead to a suspicion of bacterial endocarditis.—*Boston M. & S. J.*, July 14, 1927, p. 41.

Case Reports

REMOVAL OF A SIXTY-FIVE POUND FIBROID

By E. S. Hicks, M.D.

Brantford

Mrs. P. came under observation August 28, 1916, on account of an enormous abdominal tumour. Examination at her home showed her to be in a critical condition; dyspnœa with a respiration rate of forty; pulse one hundred and forty; some cyanosis from upward pressure; temperature, 102.7°; a very pronounced mitral systolic murmur. Her weight with the tumour was one hundred and sixty-three pounds. She was transferred to the Brantford General Hospital the same day, and the following day we operated on her. We started with local anæsthesia, making an incision from the ensiform cartilage to the pubis. Our idea was that after opening the abdomen the pressure would be relieved and we might then be able to give ether. Our incision was about twenty-two inches long, as it followed the outline of the tumour. As soon as the abdomen was opened the tumour immediately extruded. Many long adhesions were present, attached to the anterior abdominal wall, and these were severed wherever they appeared. One hour was spent in this way and in waiting for the patient's breathing to improve. Ether was then administered by Dr. Nichol and the operation proceeded with. The tumour evidently originated on the left side. The blood-supply on the right side was secured; this not being difficult, as the relations were practically normal. On the left side, however, we were confronted with an enormous plexus of large veins, and the left uterine artery, which was as large as a lead pencil. The tumour was removed with the upper segment of the vagina attached. This was the easier method as the vaginal vault was pulled high up to the level of the umbilicus.

When we had the tumour removed, we found that the stomach and intestines were pushed high up under the ribs, the former site of the tumour now presented as a cavity of large dimensions and what to do with it was the question. To aid in keeping up the intra-abdominal tension and to temporarily fill this space we poured in three gallons of sterile water and then sewed up the abdomen tightly.

Our patient made a good recovery; in four days the fever was gone, and she left the hospital in twenty-five days. A review of her condition in 1925, nine years later, showed the scar reduced to about eight inches; the heart murmur entirely gone, and the patient in fair health, except for intermittent glycosuria.

A review of the literature at our disposal reveals two or three interesting cases. First, Dr. Cullen of the Johns Hopkins Hospital in his work on myomata, page 512, cites one of eighty-nine pounds, His was, however, a cystic myoma while ours was a solid tumour. A second is one of T. Spencer Wells, given in the *British Medical Journal*, May 11, 1878. He reports the successful removal of a seventy-five

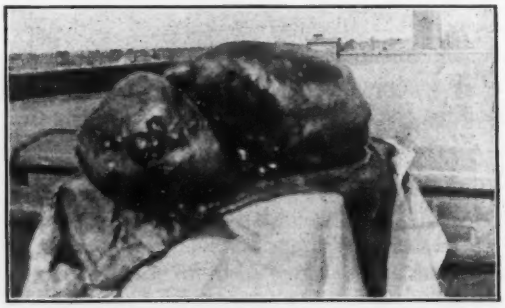

Fig. 1

pound uterine myoma. The third most interesting report is of the largest fibroid on record. This was removed post mortem by Dr. Hunt and, was reported in 1888, in the *American Journal of Obstetrics*, page 62. This tumour was a cystic fibroma, weighing one hundred and forty pounds, and was the cause of the death of the patient through pressure.

We are appending a photograph of our case, showing the tumour on a small table.

A CASE OF SYMPATHETIC OPHTHALMIA OBSERVED OVER A PERIOD OF SIX YEARS*

By S. Hanford McKee, B.A., M.D.

Montreal

It is not my intention in this report to take up or discuss the merits of the different ways of treating sympathetic ophthalmia, and especially the later ones, such as the use of diphtheria antitoxin or the Coro method, but simply to give the details of a very severe case of sympathetic disease, that finally reacted completely to the use of salicylate of soda internally and a 3 per cent solution of atropin locally.

According to Gradle, quoting Schirmer, the first available reference to the fact that internal disease of one eye may depend upon the other was by Bartisch in 1582, who says, speaking of injuries to the eye, that these may be followed by shrinking of the eyeball, which is very painful, "and in this case the other eye is in great danger". In the first third of the nineteenth century, several writers, Demours, Wardrop, and Lawrence, showed definitely that they recognized the existence of sympathetic ophthalmia as a clinical entity, and in 1818 Demours reported three cases, in which he definitely established the existence of sympathetic disease. In 1840, Mackenzie, in the third edition of his famous treatise on the diseases of the eye, pp. 523-534, first named the disease and gave the first formal description of it. "Whenever I see sympathetic ophthalmia, even in the first stage, I know that I have to contend with an affection, which, however slight its present symptoms may be, is one of the most dangerous inflammations to which the organ of vision is exposed." Mackenzie's contribution was epoch-making, and, taken with the reports of Lawrence, Crompton, Prichard and Critchett, established a firm knowledge of the disease. In 1854 and 1863, Prichard and Critchett, respectively, urged enucleation as curative and preventive of sympathetic ophthalmia. In 1863 Critchett said of this disease, "That which especially claims interest in these cases is the tediousness, the insidiousness, and the obstinacy of the inflammation, the destructive influence which it exercises on vision, and the resistance which it shows to all kinds of treatment."

For many years, since then, sympathetic ophthalmitis, sympathetic ophthalmia, sympathetic uveitis, a serous or plastic inflammation of the uveal tract of one eye due to effects of a similar inflammation in the other, has been well recognized as a definite clinical entity.

In nearly all cases it is due to a perforating injury involving the ciliary region. In genuine cases, the first symptom, as pointed out by Mackenzie, is dimness of sight. This comes on insidiously, without pain or premonitory symptoms. Within twenty-four hours, there is generally found a slight circumcorneal congestion, with a few deposits on Descemet's membrane and with very mild iritic adhesions. Without proper treatment, the inflammatory process quickly increases, with complete occlusion and seclusion of the pupil. The following is the history of a severe case:—

J. D., an adult male of 47 years, was injured by a small piece of steel entering the right globe on October 20, 1920. Two or three days later, the foreign body was removed by magnet, and a small piece of prolapsed iris excised. The eye did not quiet to my satisfaction, but as the patient kept bothering about getting home, he was allowed to leave the hospital to attend the out-patient department. He came to the out-door only fairly regularly. On November 22nd, that is less than a

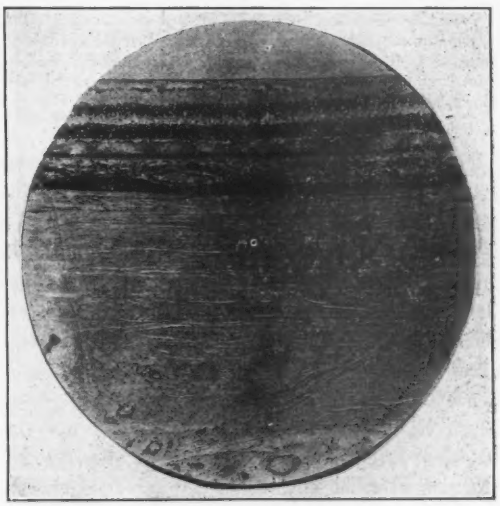

Fig. 1.—Cross section of a normal eye to show relationship between choroid, retina, and sclera.

* Read at the meeting of the American Academy of Ophthalmology and Oto-Laryngology, Detroit, September, 1927.

month after the injury, he was advised that he must again enter the hospital. He did not appear again until November 29th, when he was sent into the wards. At this date, the injured eye had all the earmarks of a plastic iridocyclitis. There was diminution of vision, marked photophobia and pain; severe tenderness in the ciliary region, and a tension of 18, Schiotz. Examination showed the uveal tract of the uninjured eye to be already involved. In spite of the inflammation in the uninjured eye, I decided to enucleate the injured one, as I had followed that course overseas with satisfaction. Consequently, on November 30th, the day following his appearance at the out-door, he was sent into hospital and the injured eye enucleated. (Figs. 1 and 2). In

FIG. 2.—Cross section of the eye which caused sympathetic ophthalmia, showing massive infiltration in the choroid.

this eye, which caused sympathetic ophthalmia, we had a pathological lesion definitely in the uveal tract. The choroid was about twice the normal thickness, due to massive infiltration. The vessels were dilated, and the sclera showed some inflammatory reaction about the blood vessels. The retina was œdematous.

Following the operation, he was put upon the usual treatment of atropin in 1 per cent solution, hot compresses, diaphoresis, mercurial inunctions. In spite of this, the disease ran a most malignant course. The eye became most painful, the iris bound down, and vision reduced to hand movements. An attempt was made to control the inflammation by the use of neosalvarsan, although his Wassermann was negative, but this treatment also had not the slightest effect upon the course of the disease. He was seen at odd times by Dr. Mathewson and myself, and finally we began instillations of atropin in 3 per cent solution, and put the patient on salicylate of soda, beginning with grs. xxx, three times daily. His mouth, which had been in a disgusting condition with pyorrhœa, was also attended to. From this point the patient began to improve, the eye quieted, became free from pain, and his vision began to improve. Under this treatment his eye completely cleared up, so that he was discharged from hospital, February 14th, 1921, cured. In May, 1924, the following note was made:

"The patient has been seen by me at odd intervals since his discharge from hospital. He has not had any recurrence of inflammation, his vitreous is practically clear and his vision normal." Since that date the eye has remained perfectly well. I have examined him frequently. His eye now is normal. The vitreous is clear and his vision is 6/6, whole line.

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RODENT ULCER, OR BASAL-CELLED CARCINOMA*

BY B. A. BROWN, M.D., C.M.

Oshawa

Before outlining an example of this disease I desire briefly to review the pathological changes which determine the existence of such a tumour. This lesion is the result of a multiplication of the cells of the *stratum germinativum*, or Malpighian layer, of the normal skin. When we recall the histology of this layer of the epidermis we find that the cells are cylindrical with oblong nuclei, but when the layer undergoes neoplastic growth they assume a round, polygonal, or even spindle-shaped form.

This aberrant cellular increase is anaplastic; that is, it lacks the power to form the more highly differentiated cells of the normal histological structure, such as we see in the typical prickle-cell cancer (squamous-celled carcinoma) which, originating from the same germinal layer, presents projectile columns of prickle-cells that enclose flattened keratinized cells,

* Presented at a meeting of Ontario County Medical Association, Oshawa, June, 1925.

and constitute on section the well known "epithelial pearl". Moreover, contrary to the well-established pathological rule, the degree of anaplasia or departure from the normal in the case of a basal-celled lesion renders it less malignant.

The rodent ulcer, the commonest of all types of skin cancer, begins as pearly gray smooth nodule, usually situated on the upper part of the face or scalp. As a rule, ulceration takes place early, and, after the original tumour has disappeared, the lesion is characterized by slow growth, the cancer cells invading the rete first, this leading to shallow and dry ulceration. with undermining of the edges, fibrosis, and cicatrization in certain parts. Often there is a superficial wrinkling, due to contraction of the fibrous tissue. Only late in its course, when there has been much erosion, does this show deep infiltration and metastatic formations.

Case Report

The patient, aged 56 years, was a railway foreman of stout build, who, at the age of 10 years, had been hit on the head with a stone. This left a mark, which later developed into a small gristly lump that at the age of 15 years had attained the size and shape of a bean. This mass gradually enlarged until the age of 22 years, when it became noticeable protruding through the hair and was about the size of a hazel-nut with a central pin-point opening discharging a watery secretion. Surgical removal at this stage resulted in complete healing, leaving a raised longitudinal scar. Twenty years later a second tumour was noticed, very small, but gradually increasing, until at the age of 50 years it was of the size of a small soft butternut, and had a discharging sinus. About this time he was struck by a piece of steel, which caused a rupture of the mass, and resulted in a raw sore. This extended and became more troublesome during the next four years, when the patient sought medical aid.

I was first consulted January 17, 1924, for the relief of headache and for treatment for the irritable sore. Examination revealed an ulcerated area, about 2 inches square, over the anterior portion of the right parietal bone in the region of the coronal suture. The edges were undermined with serpiginous extensions in some directions and areas of fibrotic healing along other borders. There was a central necrotic mass with almost complete loss of soft tissue, and bony exposure. Wassermann and other laboratory tests were negative, and nothing abnormal could be found in any of the other systems of the body. The patient, except for the pain, discomfort, and a slight degree of anæmia and weakness, was able to carry on his duties.

The lesion progressively extended producing a widespread destruction of the soft tissues and bone, until the anatomical destruction (as partially shown in the accompanying photograph, taken four months before death) included complete sloughing of the parietal bone well beyond the median sagittal suture line, and included more than one-half of the vertical portion of the frontal bone and involved the supra-orbital arch with its internal and external angular processes, and a portion of the ethmoid bone. There was exophthalmos and sloughing of the ocular tissue, which was only held in the distorted orbit by a secondary fibrosis.

On examination Babinski's sign was present and there was marked exaggeration of the reflexes. No definite mental changes were noticeable until one

month prior to death, when he was confined to bed owing to his extreme anæmia and inability to take nourishment, partly as a result of difficulty in mastication and deglutition owing to the massive induration in pre-auricular, salivary, and cervical glands, and partly as a result of vomiting and coughing due to an implication of the gastro-intestinal and respiratory systems. Consciousness and vision (in left eye) were retained up to within three days of his death, when the vast pulsating exposure of dura mater perforated, and emitted a quantity of dark hæmorrhagic purulent material, with apparent particles of brain tissue, and hemiplegia and deep coma ensued. The patient died December 25, 1926.

When this man came under my care I referred him to a radium specialist, who sent him to a skin specialist, who in turn referred him to a radiologist. The reports of these three consultants stated that, due to the bony envolvement, they could attempt nothing of a curative nature, and that only palliative treatment could be instituted. Throughout the course of the illness the wound was protected and de-odorized by potassium chlorate and mercuric biniodide compresses, and the patient was relieved by administration of chloral, bromides, and, later on, morphine.

Rodent ulcer must be differentiated clinically from the following conditions: squamous-celled

carcinoma proper, or prickle-celled cancer, lupus, and tertiary syphilis.

The prickle-celled cancer usually begins as a fungating cauliflower-like growth, or as a small crater-like ulcer, with early infiltration and widespread metastases in the surrounding lymphatic glands, and runs a rapidly malignant course.

Lupus is a disease of much earlier life; it does not appear first as a wart or tumour; deep ulceration is the exception; it never shows marginal induration, as the edges are composed of soft friable material.

Tertiary ulcerative syphilides are much more difficult to differentiate from cancer. The lesion of tertiary syphilis is usually multiple, and will cover in months an area which it would take years for rodent ulcer to produce.

The interesting features in connection with this case are: (a) The early history of trauma, at the age of 10 years, and the length of time that elapsed between surgical removal and the first evidence of recurrence (20 years). (b) The slow progression of the recurrent lesion; failure to ulcerate for a period of 8 years; and the marked tendency to exhibit marginal fibrosis and induration, remaining locally malignant, without metastasis, until an exceptionally late date. (c) In the later stages, the marked disproportion between the anatomical changes and the severity of the symptoms.

SOME RECENT RESULTS IN RETINAL DETACHMENT FROM THE INTERNAL USE OF IODINE

By R. Kerry, M.D.
Montreal

The following results recently obtained in some cases of retinal detachment, following the use of iodine, seem worth recording, as they hold out a prospect of benefiting a very intractable condition, without resorting to operation, the effect of which is doubtful and fraught with risk. The prolonged rest in bed so often ordered in this condition would appear to be unnecessary. There is no indication of recurrence in these cases, and they furnish an interesting demonstration of the stimulation of cellular metabolism due to iodine.

The first case, a man of forty years, came in two weeks after he had injured his eye by striking against a door. There was frank detachment from 4.30 to 6, with flat detachment or œdema up to a line passing from 3 to 9 o'clock. Two days after the first injection of iodine the œdema had disappeared, and within a week the retina had become re-attached. It was then seen that a gross defect present in the visual field, which was greater on the temporal side, although the detachment was also greater on that side, was due to direct injury to the inferior nasal artery. The scotoma, which had invaded the fixation point, gradually receded and in six months' time was causing practically no inconvenience. Recent reports, two years after the accident, indicate that the eye is causing no trouble.

The second case, a man of fifty, came with acute, generalized œdema of the retina in the right eye, with accumulation of fluid in the lower part of the eye. There were in the fundus, a number of fairly large, buff-coloured patches of exudate, taking their contour from the nerve-fibre layer, which appeared to be floating on the retina. Vision was practically nil.

Two days after the first injection the fluid had absorbed, and the fundus appeared as though there were an old choroiditis present, minus the pigment changes. Vision 6/9 with correction. In three weeks' time there were a few small atrophic patches in the fundus; luckily, the macula was not involved and the vision was 6/6. Rheumatism and dental sepsis were present in this case, but the blood was not examined.

The third case was a woman, just under forty, on whom I had refused to operate two years previously for cataract, because of her poor general condition. Since that time she had been under anti-syphilitic treatment, and though much improved was still a poor risk for a good result. Two weeks before her first visit, a finger had been poked with violence into her seeing eye, causing a smart external hæmorrhage. Examination showed retinal detachment extending from below to well above the horizontal line. Vision was less than 6/60. Two days after treatment there was still a little œdema just below the disc, which disappeared in the next few days. Vision with correction was about 6/9. As there is central opacity in the lens in this eye, better vision can hardly be expected, and as she can read Jaeger 1, the visual defect cannot be due to a retinal lesion.

Spontaneous re-attachment, when it occurs, is usually too late to prevent a permanent loss of function and any measure which tends to save sight is worth careful and systematic investigation.

THE TREATMENT OF A CASE OF CYCLO-IRITIS FOLLOWING SENILE CATARACT EXTRACTION

By G. Herbert Burnham, M.D., F.R.C.S. (Ed.)

Toronto

George N. consulted me regarding the sight of his eyes, saying he supposed that he was getting cataracts. He was a well-preserved and active man, 77 years of age. The cataract of the right eye was matured. In August, 1926, I extracted it. The operation went off smoothly and the eye quickly healed without any complication. I sent him home, the eye being perfectly quiet, at the end of eight days, with a good clear pupil save for a slightly opaque capsule. Ten days after his arrival home he again consulted me, as the eye operated upon—the right—had become red and painful. On examination, I found cyclo-iritis present. Two days prior he had quite a severe chill from carelessness on his part. This was the exciting cause, and one which often gives rise to a low type of inflammation and one difficult to control. I treated the case with the usual remedies, but it gradually got worse, and the condition was heading towards the so-called low or semi-purulent type. On the fifth day I decided to alter the treatment. I now changed to the combined treatment,[1] which consists of the hypodermic injection of pilocarpine, and internally mercury and the iodide and bromide of soda. The first injection lessened the pain and each day saw an improvement. At the end of ten days, that is after ten injections the eye was quite quiet and had fully recovered. The strength of each injection was gr. 1/6, with the exception of the first which was only gr. 1/8.

An inflammation of this kind after cataract extraction, originating as in this case, is always to be dreaded, as it is very apt to be of a severe type. The capsule in the pupillary area was after recovery thinner, whereas it is usually denser, as the result of the cyclo-iritis. The eye has given no subsequent trouble, and the vision is good. Knowing how oculists dread this disease after cataract extraction, I have deemed it advisable to draw attention to this case.

The combined treatment seemed so successfully to control the disease that I felt that in it was a remedy which would enable the oculist to realize that this form of cyclo-iritis could be treated with a very gratifying amount of assurance of success. The result has been so good that, in any form of cyclo-iritis after cataract extraction, I should, if it did not at once yield to the ordinary remedies, use the combined treatment.

The man bore the treatment without any trouble whatsoever, and was greatly pleased with the instantaneous relief and rapid recovery under the change that was made. Previous to the alteration in treatment, I was using atropine, now I stopped it, as I always do when I employ the combined treatment in cyclo-iritic conditions. This treatment removes any iritic exudation, and thus the pupil, though at first more or less bound down, is subsequently released as a result, that is the exudation is absorbed. Besides being unnecessary it has a restraining effect upon the action of the pilocarpine, this being in proportion to the constitutional susceptibility in regard to atropine.

I also wish to draw attention to other types of iritis and cyclo-iritis, in which the usual treatment brings about a good result, but so often with a few posterior synechiæ and sometimes a diminution of acuteness of vision due to unabsorbed exudate. In cases of this type the use of the combined treatment is followed by recovery more rapid and complete, with unimpaired vision, as the exudate is absorbed. Moreover, the tendency to relapse, which is always feared with the former mode of treatment, is with this latter avoided. If any relapse occur it is so seldom, that I may say it is not taken into consideration. In fact, the combined treatment seems to eliminate the danger, as the recovery is so thorough. The unabsorbed exudate, so often a sequence of the usual form of treatment, can be removed in this way, so as to give clear media, though a variable lapse of time has occurred since the deposit of the exudate.

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Reviews and Retrospects

THE INHERITANCE OF THE BLOOD GROUPS AND ITS MEDICO-LEGAL APPLICATION*

By Theo. R. Waugh, M.D.

Montreal

It has been known for over fifty years that the serum of many species of animals possesses the power to agglutinate the red blood-corpuscles of other species. Isoagglutination, however,—that is agglutination of the red cells by contact with blood serum derived from another individual of the same species—was first described by Grünbaum[1] and by Shattock[2] in 1900, and mistakenly supposed to be the result of disease. Landsteiner[3] in 1901 reduced its occurrence to a definite law, and stated that all human beings, without regard to race, sex, or state of health, fell into one of three groups. Descatello and Sturli[4], in the following year, reported four persons who did not fall in with the specifications of these three groups, but a fourth group was not definitely established until the work of Jansky[5] in 1907. He defined the four groups as follows: Group I; the red blood-cells are not agglutinable by any other human serum, but the serum possesses the power to agglutinate the red cells of all persons not belonging to this group. Group II; the red cells are agglutinated by serum from the first and third groups, while its serum agglutinates the red cells of the third and fourth groups. Similarly, the red cells of Group III. are agglutinated by serum from the first and second groups, while its serum agglutinates red cells of the second and fourth groups. Finally, Group IV possesses red cells which are agglutinated by the serum of all other groups, while its serum does not possess any agglutinating power. Unfortunately, Moss[6], in subsequent publications, reversed the specifications of Group I and Group IV, and, although Jansky's grouping has priority and was officially adopted in America by the American Association of Immunologists and the American Association of Pathologists and Bacteriologists, the grouping according to Moss is more generally employed in this country. This has lead to considerable confusion which, however, can be readily done away with, as suggested later.

Through the work of a number of observers, principally Descatello and Sturli, our knowledge of the nature of the isoagglutination reaction gradually increased. It was found that the specific agglutinability of the red cells develops first and is usually present at birth, while the specific agglutinating power of the serum develops later and may not appear for several months after birth. Moreover, it was found that once the characteristics are established they are constant throughout the life of the individual. These findings, together with various serological experiments, the details of which cannot be gone into here, have now quite definitely established the fact that, as far as the red cells are concerned, we are dealing with two properties of agglutinability, or "agglutinogens," as they are called, and designated A and B. The agglutinating property of the serums, on the other hand, is due similarly to two distinct "agglutinins," as they are called, and designated α and β. If we apply this to different blood groups. it becomes very simple. Using Jansky's nomenclature, Group I is $O\alpha\beta$; that is, neither A nor B is present in the red cells, hence they cannot be agglutinated; while α and β, or both agglutinins, are present in the serum, and therefore it agglutinates all other groups. Similarly, Group II is $A\beta$, Group III $B\alpha$, and Group IV ABo. The last group, therefore, has both agglutinogens; *i.e.*, its red cells are clumped by either agglutinin, but it has neither agglutinin in its own serum.

Since agglutinins always develop shortly following birth, in the absence of the corresponding agglutinogen, we can for practical purposes disregard the agglutinins, that is α and β, in our terminology, and represent the groups merely by the absence or presence of agglutinogens. Hence, Group I of Jansky and IV of Moss become merely Group O; Group II, A; Group III, B; and Group IV of Jansky and I of Moss, A.B.

It would save considerable confusion if the numerical designations were dropped and the letters used entirely in the literature, for they designate at once the actual properties of the cells and consequently the serum. As a matter of fact, their use is now becoming quite general. In the remainder of this review, we shall, therefore, refer to the groups as O, A, B, and AB.

Studies of the blood of a large number of individuals in various countries have revealed most interesting changes in the group ratios in different races. In a general way it may be said that as we go from Western Europe east to the Pacific there is a gradual change from a marked predominance of the agglutinogen A factor to that of agglutinogen B. For instance, if we examine for the B factor, we find it in approximately 16 per cent of the English, French and Italians, 20 per cent of the Serbs, Greeks and Bulgarians, 24 per cent of the Arabians, 25 per cent of the Turks, 28-30 per cent of Russians and 44 per cent of Chinese. So, while in the English the groups are divided approximately: O—46 per cent, A—44 per cent, B—7 per cent and AB— 3 per cent, the Chinese show: O—32

*Read before the Osler Reporting Society, Montreal, October, 1927

per cent, A—24 per cent, B—34 per cent and AB—10 per cent. This naturally leads us to the question of inheritance.

The idea that the group to which an individual belongs is due to inherited factors was suggested first by Langer[7] in 1903. In 1908 Ottenberg and Epstein[8] brought the matter before the Pathological Society of New York. It remained for von Dungern[9] and Hirschfeld in 1910, however, to first conduct a systematic research into the problem. Their work laid the foundation for all subsequent investigation along this line. They showed, by examination of a large number of families, that the group characteristics are inherited and that they follow the laws of dominant and recessive unit-characters laid down by Mendel. Their explanation of the action of the law is briefly as follows: It is the presence or absence of the agglutinogens A and B in the red cells which are the inherited characteristics, while the formation of agglutinins in the serum is merely secondary. The two agglutinogens take the form of two quite independent allelomorphic pairs—*A* and *Not A*, and *B* and *Not B*. They are to be compared to such separate characteristics in peas as smooth and wrinkled, and yellow and green; and, although they both have to do with the agglutinability of the red cells, are inherited separately, and lie at different points in the chromosomes. *A* is dominant to *Not A*, which is recessive; and *B* is similarly dominant to *Not B*.

From this hypothesis it was possible to work out the inheritance of the blood groups and the findings in children agreed so well with this hypothesis that it has been accepted up until very recently as the correct explanation. To show how well it applies, Lattes[11] has collected the findings from several workers on the subject, which show that out of 900 families with 2,000 children only 17 children failed to agree with the possibilities offered by the grouping of their parents. Considering the possibility of occasional errors in technique in determining the blood group and errors in morals leading to illegitimacy, the figures demand acceptance of the principle of group inheritance.

Bernstein , in 1924, however, pointed out that von Dungern and Hirschfeld's hypothesis of two independent allelomorphic pairs is to be questioned. While it satisfies exactly the known results of individual inheritance, it does not agree, as it should if correct, with certain formulæ which may readily be constructed from it as regards the ratio of blood groups in a community. He, therefore, advanced a new hypothesis, which is in fact simpler and agrees so perfectly as regards estimated and determined ratios in different races that it has been at once accepted. As regards individual inheritance, it does not alter, but rather supplements the previous hypothesis, for it limits more closely the possibilities of different groups in the offspring.

His hypothesis is referred to as that of three multiple allelomorphs, which method of inheritance has recently been shown by Morgan to be common in the fruit fly. It signifies that, instead of independent pairs acting at distant points in the chromosomes, one has, at a specific corresponding point in a specific corresponding chromosome of every male and female gamete, one of three possible allelomorphs, *i.e.*, unit characters.

In this case these are: (1) the presence in the red cells of agglutinogen A, referred to as A; (2) the presence in the red cells of agglutinogen B, referred to as B; (3) a unit character representing the absence of either of these, which is recessive to A and to B, and which is termed, therefore, R. A and B are both dominant to R. From this one can readily work out the inheritance formulæ of the various groups:

Group	O	A	B	AB
	RR	AA	BB	AB
		AR	BR	

It will be noted that individuals of either Group O or Group AB have only one possible inheritance formula, while individuals of Group A or Group B may be either pure A or pure B, *i.e.*, homozygotic; or a combination with the recessive character R, *i.e.*, heterozygotic.

From the ethno-anthropological standpoint, and as regards the distribution of the blood groups over the earth, this hypothesis is particularly applicable, as it suggests and fits in with a theory that originally the human race was entirely R, but that there arose in Western Europe by mutation the character A, and in Asia by mutation, the character B. These have since mingled to a certain extent, but still show the predominance of the original local mutation. Native races of distant islands, as the Philippines, are almost entirely Group O—that is, free from the effect of the two dominant mutations which have spread over the mainland, where intermingling so readily occurs.

Turning, finally, to the medico-legal application of this knowledge we are particularly indebted to Ottenberg[13] in America and Schiff in Europe, though many authors have written on the subject. It is applicable chiefly in two ways: first, in cases of homicide, and secondly in cases of possible illegitimacy, mixed children, etc.

To take an example of the first type. An individual commits murder, is suspected, and blood stains are found on his clothing. He maintains that they are due to his having had a nose bleed. As the agglutinins in the serum are not destroyed by drying, the stains are examined and found to be those of Group O blood. Subsequent examination reveals the suspected individual to be Group A, while examination of blood from the murdered body shows it also to to be Group O. While this evidence is not positive proof that the suspected man committed the murder, it positively condemns him of false statement, and at once attaches suspicion to his evidence. Of course, in some cases the groups

happen to be the same, and no evidence can be gained by the employment of the test.

As regards the application of the test to the questions of relationship between offspring and parents, several interesting points should be brought out. From Bernstein's inheritance formulæ of the blood groups, one is at once able to figure out the possibilities of relationship between parents and offspring. For instance, if the mother and father are Group O, all children must be Group O. If one parent is Group O and the other Group A, the children can be either Group O or Group A, but never B or AB. If one parent is A and the other B, the children may be any of the four groups, while if both parents are AB (and, by the way, only one such family has ever been reported) the children cannot be Group O, and so forth through all possible combinations. It is a simple application of the principles laid down by Mendel, and can be readily worked out if one keeps in mind the inheritance formulæ.

It is interesting that in contrast to many inherited factors, as hæmophilia, etc., the blood grouping bears no relation to sex; *i.e.*, it makes no difference whether it is the father or the mother which is of a certain group. This is explained by the fact that the unit character is not attached to the sex chromosome, as it is in sex-linked characters. Noteworthy, moreover, is the fact that from the legal standpoint the evidence never positively establishes the relationship, though it may positively deny it. For instance, you can never say positively that an individual is the father or mother of a child, or that the child is positively the offspring of certain parents, but one can say under certain circumstances (certain combinations of the blood groups) that an individual cannot be a parent of the child or that the child cannot be the offspring of the couple in question.

In this review we have merely skimmed over the surface of a surprisingly broad and deep subject. We have purposely omitted for brevity the pros and cons which surround the acceptance of some of the facts. Contrary opinions are often introduced in the courts to invalidate such scientific conclusions, and the result is that the jury is confused and the judge throws out the whole medico-legal evidence. With the mass of reliable scientific data which has accumulated, however, one has no reason to doubt to-day its medico-legal value.

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Reflex Vomiting from Heart. — Robert A. Hatcher and Soma Weiss, New York, have investigated the seat of the emetic action of various drugs, and have paid special attention to the digitalis bodies. Emphasis is placed on the fact that all the digitalis bodies exert closely similar cardiac actions, but there are different paths for the emetic impulses induced in the heart by different members of the group. Experiments on intact and eviscerated animals show that the emetic action of the digitalis bodies is not exerted on the stomach or intestines. Vomiting is not induced by the direct application of any digitalis body directly to the centre, though the authors have induced it in this way with minute amounts of many drugs. Vomiting is not induced by the perfusion of the brain with blood to which a digitalis body has been added, but it is induced by the intravenous injection while the brain is perfused with blood in such a way as to exclude digitalis body from the centre. Cutting the cardiac fibres of the vagi and extirpation of the stellate ganglions, or cutting the cord above the level at which fibres from the heart enter, abolishes the emetic action of the digitalis bodies. The effect is not due to depression, as has been intimated, for the far more severe operation for evisceration does not interfere with the emetic action of these drugs. New paths are probably formed after the heart has been denervated as far as possible. Nicotine abolishes the emetic action of ouabain and that of intravenous doses of strophanthidin by paralyzing afferent endings, or, possibly, by paralyzing the connections in the ganglions through which the afferent fibres from the heart to the vomiting centre pass. Nicotine does not abolish the emetic action of irritants, including strophanthidin and mercuric chloride, when they are applied directly to the peritoneum. It does not depress the vomiting centre. The vomiting centre is not stimulated for more than a few minutes by the direct application to it of a single dose of any emetic so far as we know. Recovery follows promptly after the application of a moderate dose, and depression follows a large dose within a short time. The cardiac actions of digitoxin and those of digitalis are persistent, and their emetic action often persists for days.—*Am. M. Ass., J.*, Aug. 6, 1927.

Editorial

CANCER: A CONSTITUTIONAL OR LOCAL DISORDER?

THERE can be no doubt that at the present time the prevailing view among medical men generally in regard to the nature of cancer is that it is at first a local affection, spreads regionally by way of the lymphatics, and finally produces numerous scattered and distant growths by the process of metastasis. Hence, the most rational handling of such cases lies in early diagnosis and early removal. This is the conception that has been emphasized before the general public in the various anti-cancer campaigns that have been undertaken of late years. There can be no doubt also, in the light of our present knowledge, or, rather, ignorance, that this is the most useful position to take.

The arguments in favour of a local origin are strong. Carcinomata develop in certain areas of predilection, notably, at points where there is a transition of epithelium, some cell-displacement, or some irritation, whether mechanical, physical, chemical, or parasitic. Extension is by well-defined paths radiating from a centre. The multiple distant growths, so often developing in late cancer, are readily explained by the dissemination of cells belonging to the original growth by way of the circulatory apparatus. The most convincing point of all is that several workers, notably Adami, Woolley, and Jores, in studying very early cases of multiple tumours of the adrenal cortex, found occasional cells, directly connected with those of the zona radiata and unconnected with the cancer nodules, which by their size and deeply staining nuclei could be identified as of cancerous type. Analogous findings in the case of multiple carcinomata of the liver have been recorded by Van Heukelom, Daniels, Tolot and Oertel. It is only fair to say, however, that this conception has not always been accepted. Indeed, there is sufficient evidence before us now to warrant us in heeding the old warning,—*Audi alteram partem.*

The opposing view, stated broadly, is that the blood is contaminated, and that cancer is the local evidence of this. One of the earliest to express this view was Sir James Paget, who held that "malignant tumours are local manifestations of some specific morbid state of the blood, and that in them are incorporated peculiar morbid materials which accumulate in the blood."

Abnormalities were detected many years ago in the blood of cancer patients, in the form of altered fibrin content and the presence of glistening (probably fatty) particles. More recently, alterations in the cholesterol content of the blood have been noted by several observers. Wacher and Hueck (1913) and Denis (1917) found low values for cholesterol in the blood in diseases characterized by prostration and cachexia. Luden (1916) and De Niord (1920) reported a pronounced hypercholesterolæmia in cancer cases. The results of these investigations, however, are often discordant and unconvincing. This is probably due to several causes. The normal amount of cholesterol in the blood has not been determined with sufficient accuracy, the figures given by different workers varying considerably. One reason for this is, it may be pointed out, that it has not been generally recognized that the amount of cholesterol in the blood exhibits a considerable seasonal variation. There are errors in technique to be reckoned with also. Jung and Wolff (1922) have pointed out that spontaneous coagulation of the blood is always accompanied by an accession of lipoidal substances and cholesterol. Consequently, in making these estimations, blood plasma only should be used. An improved and uniform technique is imperative, therefore, if we are to get reliable information. However, it seems fairly clear that there is some connection between cholesterol metabolism and cancer. Robertson and Burnett (1913) discovered that the blood and tissue concentration of cholesterol and allied substances is closely related to the rate of cancer

growth—cholesterol acting as a stimulant; lecithin, as an inhibitor. Luden has confirmed (1920) her earlier observations that there is a high cholesterol content in cancer, as well as in some diseases that are clinically associated with it. She has also found that the exhibition of cholesterol definitely promotes the proliferation of cells, and that the intravenous injection of this substance doubled the rate of growth of tumours grafted into rats. All of the sources of cholesterol in the body have not yet been discovered, but it is probable that much of it is the product of protein disintegration, and that some is derived from certain articles of food. A diet composed of fruit, vegetables, cereals and milk has been found to reduce the amount of cholesterol in the blood.

Experimentation with diets has thrown much light on the causation of the so-called "deficiency diseases," and this method of study might be extended with advantage to the problem of cancer development. Some recent observations of Fujimaki and his coworkers (Gann, 1927, 21, 8-15.) are remarkably suggestive in this connection. They found that, by depriving rats of Vitamin A for prolonged periods, from 58 to 318 days, they could produce marked proliferative changes in the epithelium of the forestomach, amounting to veritable squamous-celled carcinoma, and, to a less degree, similar lesions in the pelvis of the kidney, bladder and salivary ducts, and all this in the absence of any local irritation.

Nakahara has found that the previous injection of homologous living cells produced a definite resistance to cancer. Also, the injection of olive oil, and unsaturated fatty acids (notably, oleic, linolic and linoleinic) produced the same effect, though this power was not shared by the saturated fatty acids. A connecting link here may be found in the fact that all these agents stimulate the lymphocytogenic tissues of the body to increased activity.

The suggestion has been made more than once that cancer development may be an effect of perverted action of the endocrine glands. Leo Loeb, for example, by incising the wall of the Fallopian tube and turning out the mucosa, was able to produce papillomatous nodules on this membrane, an effect which he attributed to the action of the *corpus luteum*.

While studies have been numerous on such matters as the morphology and arrangement of the nuclear chromatin of cancer cells, their power of proliferation, their peculiar metabolism, their relationship to the tissues of the host, and the local agents that are competent to produce abnormal and excessive cell-proliferation, there have been singularly few dealing with the constitutional factors that may possibly enter into the problem. In fact, the cancer cell has monopolized attention. This emphasizes the danger of adhering too slavishly to the theory of the local origin of cancer, however admirable it may be from the practical standpoint. It is time that the general bodily states in their relation to cancer, including hereditary taints, the internal secretions, cholesterol and fatty acid metabolism, and the rôle of the lymphocytogenic organs, should receive more attention.

While saying this, we think that a little reflection will lead to the conclusion that the two apparently antagonistic views of the nature of cancer, i.e., whether local or constitutional (diathetic), are really not mutually exclusive. Indeed, there is nothing inherently improbable in a median position. Why may there not be a constitutional peculiarity which predisposes to cancer formation and is essential, while a local upset of cell-balance is required to convert this potentiality into an actuality? This notion is not new, and is well expressed in the following quotation from Sir Astley Cooper (Lectures. 1837):—"A blow or a bruise inflicted on a healthy person is followed by common inflammation. But in another, when the constitution is disposed, it would lead to the formation of a cancerous tumour. Yet the formation of a tumour does not depend entirely on constitutional derangement—there must be also a peculiar action excited in the part."

A. G. NICHOLLS.

THE SEARCH FOR INSULIN SUBSTITUTES

AS soon as the effects of concentrated solutions of insulin were ascertained, efforts were made to discover other preparations of like qualities. Collip in Canada, and Winter and Blyth in England, prepared yeast extracts with insulin-like actions. Collip showed that similar extracts, whose essential principle he named *glukokinin*, could be obtained from the green parts of many plants. These preparations when continuously used produced toxic effects which prevented their application in human diabetes mellitus.

Another plant preparation has recently been sponsored by F. M. Allen of Morristown, New Jersey, whose paper on blueberry leaves extract appeared in the *Journal of the American Medical Association* of November 5th, and a long abstract of it in this *Journal* last month. The results obtained by Allen in human diabetics were not so satisfactory as those obtained in depancreatized dogs. Nevertheless out of 60 cases in which its effects were tried, beneficial results were obtained in 36. Complete stoppage of insulin was possible only in six. In the others there was either increased sugar tolerance, or else the possibility of a reduction of the insulin dosage (with reduction in the number of injections) or both. Other observers have confirmed Allen's results with dogs, but so far few observations on the effects in man have been published. Although Allen's material is at present prepared by Messrs. Squibb they will distribute it only to investigators approved by him, and it will not be available for general use until its efficiency is proved.

In the *Klinische Wochenschrift* of May 28th last, Professor von Noorden gives a preliminary account of the effects produced by *glukhorment*, a commercial preparation made by fermentation of fresh pancreas, and whose principle is stated not to be a derivative of guanidine. The details yet available of treatment with this preparation are still too few for critical comment, but von Noorden has stated that it can partly or entirely replace insulin (depending on the severity of the diabetes). His conclusions were based on nearly one hundred cases, but apparently treatment had only been of very short duration. Glukhorment is given by mouth just after meals.

In quite another category is the work on *synthalin*. The utilization of this pure chemical compound in the treatment of diabetes represents that combination of chemical and pharmacological research which will undoubtedly become in the future one of the most important aids to therapeutics.

Watanabe, in 1918, found that injection of guanidine into rabbits produced hypoglycæmia. This suggested the long research carried out by Professor E. Frank and his colleagues M. Nothmann and A. Wagner, at Minkowski's University clinic at Breslau. It was commenced in 1921 and the results were first communicated on September 23rd, 1926, to the *Naturforscher und Aerzteversammlung* at Dusseldorf, after observations for a long period on animals, and clinical observations since the previous May. Their communication was published in the *Klinische Wochenschrift* of November 5th, 1926.

Guanidine is profoundly toxic. The problem before Frank was to find a guanidine derivative whose hypoglycæmia action was accentuated, but whose toxicity was negligible. Agmatine provided the first step in the right direction. This decarboxylated product of the amino-acid arginine, whose formula is $NH_2.C\ (:NH).\ .NH.\ (CH_2)_4.NH_2$, and which is normally produced in small amount by bacterial action in the intestine, is much less toxic than guanidine, but several times more powerful in producing hypoglycæmia. Further increase of the number of CH_2 groups only produced slight modifications in the effects. Other types of structural change were necessary. Finally, with the collaboration of the chemist Heyn, *synthalin* was prepared; it was then manufactured on a large scale by Messrs. Kahlbaum, a sufficient warranty for its absolute purity. The formula of synthalin has not yet been published, though it was communicated to the British Medical Research Council before they commenced to test the compound, and, according to their report published in the *Lancet*, it is a "diguanidyl derivative of a long-chain aliphatic hydrocarbon." The base is used in its

hydrochloride form, which is very soluble in water, and is administered *by mouth*.

Synthalin, according to Frank and his colleagues, produces all the effects of insulin both on depancreatized dogs and on human diabetics. It causes cessation of glycosuria, acidosis, polyuria, and polydipsia, and diminution of hyperglycæmia. They state that one milligram katabolizes between 1.1 and 1.2 grams of glucose and roughly corresponds to one unit of insulin. It acts more slowly than insulin and the action is more prolonged. Its main advantage over insulin is that it can be given by mouth. Of 70 diabetics tested none failed to respond, and some patients, refractory to insulin, gave good results with synthalin. A number of cases with surgical complications were successfully treated. So much for the points in its favour.

Frank emphasizes the statement that on account of the delayed action of synthalin it cannot be properly employed in diabetic coma and the pre-coma stage. Further, he enumerates certain toxic effects, especially loss of appetite, malaise, increased peristalsis, and, in severer cases, nausea, vomiting, and sometime diarrhœa. To avoid such developments he recommends that after two or three days' dosage of 25 milligrams twice a day a cessation of dosage for a day should invariably occur. He concludes by stating that synthalin is not ideal, but hopes that further work will reveal a still better agent. (According to a statement by Umber in May last, Messrs. Kahlbaum had already prepared and tested over 400 guanidine derivatives, and synthalin is evidently still to be considered the best of them.) Minkowski, in bearing witness to the accuracy of Frank's observations, remarks "Once more the value of accurate scientific laboratory work for the healing art has been demonstrated."

In the year that has elapsed numerous reports have been published from the various German University clinics, a few from widely scattered sources (Paris, Strasburg, Lisbon, Roumania) in French journals, a preliminary British report under the auspices of the Medical Research Council, in the *Lancet* of September 3rd, and one or two from this side of the Atlantic (Rabinowitch, in the August number of this *Journal*, and Joslin, quoted by Rabinowitch.)

While much of the published data is confusing, and systematic statements as to the number of cases treated and the proportion of beneficial results obtained are frequently unavailable, nevertheless certain conclusions can now be drawn definitely. An account of what appears to be one of the most careful and critical series of observations (on over 200 cases) is given by Umber and discussed by P. F. Richter and others in the *Deutsche medicinische Wochenschrift* of July 1st.

The majority of observers are fully agreed that in those cases in which synthalin can be given without immediate toxic symptoms developing a definite insulin-action is obtained. The degree to which toxicity occurs in different clinics seems largely due to the actual dosage employed. Umber, copying Frank's dosage, reports toxic symptoms in nearly half of his cases; in many of these synthalin-therapy therefore could not be continued. Richter reports a much smaller percentage exhibiting untoward symptoms, but uses a smaller dose.

It is agreed that synthalin is useless in diabetic coma and the stage preceding it, and the general consensus of opinion is that it is of little value in severe diabetes and of questionable value in juvenile and adolescent diabetes of any grade. The best cases are middle-aged and elderly diabetics of mild or moderately severe type and especially those cases controllable by diet but in whom a slightly increased tolerance is desirable. While glycosuria and ketonuria are easily banished, the blood-sugar cannot usually be reduced to normal level by synthalin alone, hence a combined synthalin-insulin therapy has been frequently adopted. This merely possesses the advantage of somewhat reducing the number of insulin injections.

A damaging statement by Umber, not without support from other clinicians, reads "It is striking that, contrary to the heightened vitality and euphoria which follow the tonic general action of insulin on even severe diabetics, synthalin sometimes produces mental depression and disagreeable sensations even when favourably influencing the glycosuria of cases treated with it."

The immediate cause of the toxic symptoms has not been determined. Frank believes them to be of central origin. Others believe them due to damage to liver tissue,

following Adler's claim that urobilinuria invariably follows synthalin treatment, though Umber states that it also follows insulin treatment and cannot be related specifically to liver damage. Various adjuvants have been used to counteract this toxicity; such as calcium carbonate, sodium bicarbonate, and especially certain derivatives of cholic acid (("decholin," etc.) which possess the property of stimulating bile secretion. Adler and others have reported very favourably concerning decholin, though the logic of its use is not apparent.

In spite of a number of favourable reports from German out-door clinics it seems reasonable to conclude, with Rabinowitch, that the use of synthalin "at the present time should be confined to hospitals in which the metabolism of patients can be carefully observed" since there is some evidence that not only its insulin-like action but also its toxic action may be cumulative. But synthalin represents a big step forward in the production of an artificial insulin capable of oral administration, and we may reasonably hope that some synthalin-derivative, more ideal in its action, will soon be discovered.

A. T. CAMERON

THE RESPONSIBILITY OF THE PHYSICIAN IN MENTAL DISTURBANCES

MEDICAL knowledge has made such rapid advances in so many different directions that it would appear impossible for the general practitioner to keep himself informed of the many additions to our knowledge which are almost daily being made in every department. Hence the necessity as well as the great advantage accruing to the general practitioner from specialism. In no field has advance in knowledge been more rapid than in the field of psychiatry and mental hygiene, and in no type of disease is it more important that correct diagnosis and effective treatment should be promptly afforded than in the case of patients suffering from mental disorder. It must unfortunately be generally admitted that few practitioners today are well qualified for the task of diagnosing and treating the many phases of mental disease. It would appear therefore to be desirable that an attempt should be made to supply our readers with an adequate working acquaintance with the recognized principles and practice in this department of medicine. It is proposed therefore to publish a series of articles written by a specialist in the field of psychiatry in which the important facts of this phase of medical practice will be stated in a form suitable to the needs of the internist, the pædiatrician, and the man in general practice.

In Canada each year there are between 6,000 and 8,000 patients admitted to mental hospitals. About half of these admissions are later returned to the community, many of them still in need of advice and treatment. For every single patient admitted to a special hospital it is estimated that there are in the community 25 others who are in want of help and advice from their physicians. For every 25 individuals who regard themselves, or who are regarded by others, as in need of medical advice, there are many more who show to the expert physician deviations in behaviour which should be recognized and dealt with. Facts evident in every community clearly indicate that the general practitioner and internist must take the greater part of the responsibility in recognizing and dealing with this problem.

Here it may be asked: what is the minimum information which the general practitioner should have?

He should realize that the law of cause and effect operates just as definitely in the field of behaviour as in the field of physical disorder; that is, that disturbances in normal thinking, feeling, and acting are due to definite causes, and treatment must be directed to the underlying factors if success is to be attained.

He should know what is to be recognized as normal in the mental development of the individual, and the phases through which an individual may pass in his developmental years, and what is to be expected from him in the way of behaviour at the various

developmental levels. The physician must know what is usual and normal in order that he may recognize and deal satisfactorily with what is abnormal in relation to mental health.

He must realize that psycho-therapeutic measures are necessary in the treatment of psycho-neuroses; physicians must realize that a negative picture in the laboratory and at the bedside does not clear up psychoneurotic symptoms; that reassurance and change of scene are at best makeshifts and only afford temporary distraction which in the end may leave the psychoneurotic in no way improved. A physician should be familiar with most of the prevailing psychological concepts and with approved methods of treatment.

An attempt will therefore be made in the proposed series of articles to present all necessary information in such practical language that it can be acquired and used by the general practitioner. It would seem just as possible and just as desirable to supply this knowledge through the pages of a general medical journal as information upon any other special field in medicine

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AN INVESTIGATION INTO THE CAUSES OF IMPAIRMENT OF HEARING

IN a recent address before the American Otological Society at the Academy of Medicine in New York, Professor E. B. Dench emphasized the importance of any impairment in the power of hearing, and especially of the type developing during the early decade of life, and urged the necessity of further research on the causes producing it.

The normal individual, he said, is endowed with hearing in excess of his ordinary needs. Owing to this excess, and to the fact that many pathological changes which produce impairment of hearing affect at first only one ear, and extend later on to the other, impairment of hearing is not noticed until the condition becomes well advanced. This failure to observe unilateral impairment is quite frequently met with and is by no means confined to the less intelligent members of the community.

Such progressive impairment of the sense of hearing may be due to one of three important causes; the first, an interference with the sound-conducting mechanism; an interference due to middle ear or naso-pharyngeal disease; the second, to changes in the bony capsule surrounding the end organ of the sound-receiving apparatus; a condition most frequently of the nature of an oto-sclerosis; and the third, to changes in the sound-receiving apparatus itself due to senile vascular changes or to toxæmia.

The first cause, starting in that portion of the ear ordinarily known as the middle ear, consists in an inability of the conducting mechanism to transmit the sounds to the deeper portions of the ear, and is amenable in a large percentage of cases to treatment. This was made strikingly apparent by Wilhelm Meyer of Copenhagen in 1870, who found that about 60 per cent of patients with impaired hearing could be improved by removal of the adenoid growth in the nasopharynx. Deafness arising from the second cause—otosclerosis—would appear to develop from some constitutional cause at present obscure. It is a condition which unfortunately progresses steadily, leading as a rule to complete deafness. Only very occasionally is there a cessation of this pathological process. The third group of cases are due to definite changes in the auditory nerve or central areas of the brain arising either from toxæmia, or from vascular changes incident on advancing years.

Impairment of hearing due to the two last causes is regarded as of such importance that a committee has been formed for the further investigation of the pathological conditions inducing these changes. Two years ago a certain sum was generously appropriated by the Carnegie Corporation for the study of this condition. On receipt of this sum the American Otological Society conceived the idea of carrying on the investigation on a broader basis than that suggested by the Carnegie Corporation, and they promptly raised another sum to be devoted to research to include all causes of progressive deafness. To prevent any overlapping in the work all the literature on this

subject is being thoroughly abstracted, and a complete index prepared and kept up to date by competent secretaries. Abstracts and index are to be kept at the research bureau of the American Otological Society and will be available to all those who wish to consult it.

For the last twenty years changes in the temporal bone, known as a rarefying osteitis, have been held responsible for the otosclerosis, and the question has arisen as to whether environment, diathetic conditions, or some perverted secretion of ductless glands has given rise to this change. For a complete investigation of this kind an abundance of material for study is necessary. The committee has enlisted the services of many larger hospitals throughout the United States and Canada, and all post-mortem specimens of temporal bones from patients with a history of deafness are requested to be sent to them. An. effort will be made to definitely establish whether the bony changes found in oto-sclerosis are associated with the essential etiology of this condition. Careful metabolic and dietetic studies are requested to be carried out on all patients showing symptoms of progressive impairment, and especially in those in which toxæmia may be a factor.

The task before this committee would appear to be a heavy one. When it is remembered that the actual inception of the investigation is little more than two years old, one can understand why so little publicity has been thus far given to this research. Much time must necessarily be spent before actual results can be obtained. The committee is co-operating with the League for the Hard of Hearing, the members of which are approaching the problem from the practical side of affording all possible relief to the condition once it is present. It is hoped that some advance in our knowledge respecting this condition may arise out of these investigations.

W. G. McNALLY

DOCTORS' FEES

IN the November issue the *Journal* published an editorial on the Cost of Medical Care, in which it was stated on good authority that rather more than one-third of the cases of illness occurring in the United States receive no medical care. This is due, in part at least, to the prohibitive cost of medical and hospital services to the large number of persons who are of moderate or slender means. The fact that illness is expensive cannot be denied, and voices have been raised recently in certain quarters which incline to put the blame for this unfortunate condition upon the medical and nursing professions. This phase of the subject is being discussed at the present time in *The Atlantic Monthly*. Fortunately, analysis of the facts puts our profession on the whole in a favourable light. It is true that medical fees are higher than they used to be, but the same applies to all the expenses of living. Even the necessities of life are more expensive. It is not always appreciated by the laity that medical men are better educated than they were, have a much longer training, and generally speaking, are more competent. All this costs money, and the labourer, particularly when skilled, is "worthy of his hire." Medical men, too, as a class, are honest, and it is their practice to render service, even when they do not expect to receive an adequate, or even any return. It is this altruistic attitude that marks the doctor as a professional man and not a tradesman. The cost of medical care rests hardly upon the honest man in what we usually call "the middle class," on a small salary, and who is endeavouring to maintain a good appearance. Here is where the doctor may fall into error. He may in some cases misjudge the resources of his patient, and render a bill which may be reasonable, even small, but at the same time disproportionately burdensome under the circumstances. With the exception of a few instances of this kind, and the few in which he manifests himself as a "gold-digger," the doctor shows up well.

Some years ago, the late Professor Buller, addressing a graduating class in medicine

at McGill University, told a story how that he and a medical friend practicing in the country had out of curiosity gone into the latter's accounts, to see what sort of a financial return he was getting on a time basis. The result showed that the medical friend was receiving daily rather less than the amount earned by a conscientious cabman.

A medical contributor to the discussion, which has been appearing in *The Atlantic Monthly*, puts the matter convincingly from the doctor's standpoint. He states that his medical and pre-medical education cost him in cold cash $11,559.43. Add to this the amount which, on a moderate computation, he could have earned in some other occupation during the time he was studying and therefore financially non-productive, the total sum with interest added amounts to $47,559.43. At 5½ per cent this would net about $2,750.00 yearly. His actual receipts, after deducting operating expenses, total the magnificent sum of twenty-five cents an hour. This is less than trades-union wages. Nor is this the whole story. The figures represent cash returns, but the doctors in his locality lose 36 per cent in collections.

What is the remedy? One suggestion may be offered here, which has been made by several of the writers in the periodical referred to, including a medical confrère from Ohio. It is, that, inasmuch as sickness in time will come to every one, each family should allocate a sum in its budget, to be set apart to meet this emergency.

The conclusion of our American friend may well be quoted, "We ask only that people play fair with us. If charity is needed, then it will be given. If only a certain fee can be charged, we will gratefully accept that and lay up the balance where moths do not corrupt, nor rust decay. Ask your family physician."

A. G. NICHOLLS

EPIDEMIC ENCEPHALITIS

A VERY interesting discussion on this much dreaded disease took place at the last meeting of the British Medical Association in Edinburgh, in which a series of valuable papers were read and a number of leading neurologists took part. The startling onset of this disease about ten years ago in epidemic form, and its rapid spread from the continent to Great Britain and shortly afterwards to America, associated with its maze of contradictory symptoms, baffled the profession in every country, and led to its being confused with several other diseases. Time, however, and the unfortunate sequelæ of nervous disabilities which followed in its train have sufficiently attested its identity as a new disease.

Every year since then, outbreaks during the spring months have taken place, varying much in the severity of the initial symptoms; that, in the spring of 1920 in Winnipeg, was of a severe type, as was that of 1923 in England. Since then, the early stages would appear to have become milder and in not a few instances, its invasion has been so insidious that beyond an undue sense of fatigue the patient is scarcely aware of any serious trouble impending. We have learned, unfortunately, that irrespective of its light onset the frightfulness of the scourge lies in its after effects. It would appear to be questionable how far these distressing symptoms are the after-result of a first invasion, or due to a recrudescence of activity, or to a persistence in activity of the disease. Dr. Riddock in his paper read at the meeting claimed that in a certain number of cases the disease seemed to be chronic from the beginning. Although the virus of the disease appears to have a predilection for the brain stem and corpus striatum no part of the nervous system appears to be immune. The disease is a general infection with a special affinity for the nervous tissues, but with power to attack other structures as well, notably the ductless glands. The variability of its clinical manifestations is therefore not surprising. Greenfield in his paper stated that we are justified in considering encephalitis lethargica as a disease in which there may be widespread and severe destruction of nerve cells, not only in the brain stem, but also in the cortex, and the neuronal degeneration which follows is quite indepen-

dent of any inflammatory reaction that may be present during the illness.

The Parkinsonian syndrome is the most common disability of a general kind, and although it may develop rapidly during the acute illness in which case there may be some hope of improvement; more frequently its evolution is slow and progressive, and in some cases its course may even show stationary periods. In its fully developed form the syndrome is familiar to most, but in its milder manifestations it may be overlooked. The early signs are found chiefly in the face which has a fixed expression with eyes somewhat staring and mouth often a little open and showing an excess of saliva in it. Although there may be no definite diplopia, mistiness of vision from defective muscle balance is often complained of. Immobility of the affected parts even with absence of rigidity is a characteristic feature, and a slight involvement of the right hand portrayed in the handwriting (micrographia) is apt to be present. Mental changes are met with most frequently in children and adolescents. Those of the restless naughty child have been described by Dr. Young in his account of the disease in this issue. Children clean and docile before the attack become cruel and immoral and very emotional. Respiratory tics and other forms of disturbance are amongst the most curious of the numerous sequelæ which occasionally follow. Attacks of heavy panting, of sighing, yawning, coughing and hiccuping have been observed, and may be accompanied by more or less rhythmic movements of the arms and trunk, as if the patient were in great distress.

It is our misfortune that so little can be done either in the way of prevention or cure. Rest in bed and freedom from mental strain are important. Dr. Young makes reference to a few suggestions which it may be desirable to try.

SEROTHERAPY IN POLIOMYELITIS

PROFESSOR G. ETIENNE of Nancy, who has devoted much attention to the study of poliomyelitis, and its treatment by serotherapy has published* recently a careful summary of what is known about this dread disease. He prefers the term "myelitis" to the older name of poliomyelitis, because in the adult the infective process is more diffuse, than in the young infant, in whom the infection is limited more definitely to the anterior cornua. From results obtained in his investigations he considered that the virus is eliminated chiefly by the pharyngeal mucosa and the tonsils. This is an important point in view of the fact that myelitis may follow coryza or sore throat, and that "carriers" may constitute a danger in epidemics.

Professor Etienne reports satisfactory results obtained from the employment of serotherapy in the three periods of the infection, in the initial pre-paralytic phase, in the stage of extensive paralysis, and in that in which the palsies have become established. He states that patients treated with the serum of convalescents during the first stage rarely develop any paralysis or do so only in a slight and temporary form. In the second stage good also there may be a definite arrest of the paralytic process with a recovery sometimes rapid from the existing paralysis. In the third stage not infrequently a portion of the paralysis clears up leaving a residuum that may be permanent. Many observers have reported that cases treated with serum injections recover more rapidly and more completely; but to obtain good results it is obviously necessary that the action of the serum intervene before definite destruction of the cells has occurred. As in all forms of serotherapy, treatment should therefore be undertaken at the earliest possible moment. Thus far the quantity of serum available for injection is necessarily very small, and Prof. Etienne for this reason advised its use by the intrathecal route. The amount injected has varied between 3 c.cm. and 13 c.cm. With larger doses unpleasant symptoms have manifested themselves.

We are particularly pleased to note that in British Columbia the Health Department

*Revue Médicale de la Suisse Romande August 25th, 1927.

is making an effort to obtain the serum from convalescents in the late epidemic, and to store it for future use. The *British Medical Journal** reports that this employment of convalescent serum has given satisfactory and sometimes remarkable results, and considers that this use of it has definitely passed out of the experimental stage.

*British Medical Journal October 22nd, 1927.

TRAVELLING SCHOLARSHIPS FOR TUBERCULOSIS

WE are very pleased to note that some thirty travelling scholarships have been generously offered by the Sun Life Assurance Company to the salaried and active tuberculosis workers in Canada. In the letter sent by Mr. D. L. Macaulay, announcing this offer to the Canadian Tuberculosis Association, it is stated that the Assurance Company has been actuated by the following facts: all of those to whom this scholarship is offered are very ardent workers and are accomplishing most important and valuable work for their country in fighting the white plague, although nearly all of them are handicapped more or less by having suffered from tuberculosis themselves; they also direct most of the tuberculosis work in the several provinces of Canada, but because of their special field are not reached by the extramural work of the Canadian Medical Association. The letter announces that the Sun Life Assurance Company proposes to give to each of the selected candidates the sum of $500.00 provided the executive of the Association will also contribute the same amount, and grant leave of absence with continuance of salary, and permit to attend clinics, to visit research laboratories and institutions for the tuberculous in England, France and Italy, and to attend the meetings of the International Union against Tuberculosis. It is hoped that much will be learned from their overseas observations and it is suggested that a careful study shall be made of the following activities as carried on in England and the continent:

(*a*) The Grancher system of taking children from homes where tuberculosis is prevalent, and placing them in supervised homes in which there is no infection, a plan which has been carried out extensively in Paris and would appear to be cheaper and more successful than preventorium practice.

(*b*) The success of Calmette's B.C.G. vaccine which is said to have been used with success in a large number of cases in Paris.

(*c*) The value of sun treatment as carried on in the several hospitals in England.

(*d*) The details of medical inspection as carried on in the higher schools in England.

(*e*) The methods and measures employed in various institutions in Italy for the treatment of tuberculosis.

(*f*) Finally, and perhaps the most important of all, a study of the sheltered employment schemes in England for the collection, housing, and provision of a livelihood, for the families of tuberculosis sufferers, and especially the Papworth colony near Cambridge.

It is proposed that the party will sail in a boat to be selected and travel by routes arranged beforehand until the programme is completed. The date for leaving is the first week of September 1928.

At the close of his letter announcing the offer of the Assurance Company, Mr. Macaulay stated that letters had been received from Prof. Lyle Cummins of Cardiff, Wales, from P. C. Varrier-Jones of the Cambridge Tuberculosis Colony, from Dr. F. J. H. Coutts of the Tuberculosis Division of the Ministry of Health, Whitehall, and from Prof. Leon Bernard, Adviser to the French Government, all of whom stated that they would have pleasure in seeing that every assistance would be given to the delegates to make their visit pleasant and profitable.

MORE WORK FOR THE NARCOTIC DIVISION

A NEWSPAPER item from Detroit dated Dec. 16th indicates the harmful use of a drug which ere long may have to be controlled as opium and morphine are at present. This drug is cannabis indica also known as hashish and in Mexico as marijhuana. The item referred to announces the death of a man presumably from the use of cigarettes containing marijhuana.

Cannabis indica has been used long and extensively in India among the Mohammedans, in South Africa, in Egypt and in Mexico. A large fraction of the insanity found in Egypt is attributed to the use of hashish and the illegal trade in hashish in Egypt has reached enormous proportions.

With the percolation of Mexicans into industrial sections in the United States this use of hashish has probably been introduced, though it may be unfair to attribute all the abuse of this drug to this source.

The active ingredient of hashish is not well known chemically. It is not an alkaloid as in the case of opium. The effect produced is said to be an agreeable kind of intoxication or, with large doses, violent delirium followed by stupor. With habitual use systemic troubles develop and finally insanity.

R. L. STEHLE

Editorial Comments

DEATH RATE IN TUBERCULOSIS

An editorial in *The Medical Officer of London*, England, reviewing the statement of Sir George Newman to the effect that we must expect the death rate to rise in the near future states that this need not disturb us; for a rise must occur as an automatic reflection of the increased average age of the population, and does not denote an increase in the actual mortality rate, nor a lowering of the average span of life.

Whether we in Canada should take any solace from this fact when considering the increase in the tuberculosis death rate for 1926, as reported by the Federal Bureau of Statistics to the Canadian Tuberculosis Association, is a point to be considered. This report, printed in full on another page of the *Journal*, shows an increase of 4.7 per 100,000 population above that reported for 1925. The 1925 death rate for tuberculosis in Canada was 79.8. This was the first time it fell below eighty. The rate for 1926 is 84.5 per 100,000 population. In this report we note that an increase has been registered from every province in Canada except two. In British Columbia the rate has dropped 2.1 per 100,000 and in Ontario 1 per 100,000. Quebec, with a little more than one-quarter of our total population, shows an increase of 17 per 100,000 above that reported for 1925; Nova Scotia has increased 11; Saskatchewan 5; and Alberta 6 per 100,000.

Several influences suggest themselves as partial explanations: The effect of the expert assistance in diagnosis now given to local practitioners in the rural centres of each province has increased the number of sick people definitely known to be suffering and dying from tuberculosis. The 1926 census figures for the Prairie Provinces are used this year for the first time in the calculation of the death rates. The change in the method of collecting and recording vital statistics in the Province of Quebec, which is now co-operating with the Federal Bureau of Statistics may have had some influence. Each year fewer of our tuberculosis sufferers in Canada are under the medical care of the Federal Department of Soldiers' Civil Re-Establishment, and fewer families of our tuberculosis sufferers are receiving financial aid from the same source. The number of unemployed reported during the past few years has been high. Some cities might suggest that the freer supply of spirituous liquors might have an unfortunate influence, but this contention is not supported by the drop in death rates registered in British Columbia, nor by the continued high rates in Quebec and Nova Scotia, as the Quebec laws have never been totally dry and the Nova Scotia laws are still as dry as they ever were.

R. E. WODEHOUSE.

THE FIRST REPORTED STUDIES ON B.C.G. IN AMERICA

That B.C.G., the bovine tubercle bacilli rendered artificially avirulent by growth on bile and used by Calmette extensively for vaccinating infants, has not previously been completely studied bacteriologically is brought out in a recently published, short, preliminary paper by Petroff[1] and his associates. We learn that the group at the Trudeau Laboratory have suc-

ceeded in dissociating a strain received directly from the Pasteur Institute into two colonies, one of which is virulent and the other non-virulent for guinea pigs. This observation tends to show that B.C.G. does not differ, as claimed by Calmette, from other tubercle bacilli, which have been attenuated by other means and of which he says in his book (*Tubercle Bacillus Infection and Tuberculosis in Man and Animals*, English translation, Williams & Wilkins, 1923, p. 568): "In the present state of our knowledge, therefore, it does not seem that we can think of utilizing any one of the bacilli of temporarily obscured virulence as a vaccine for man and cattle, under the conditions in which we employ cowpox for variola, for example. It seems, on the contrary, that such bacilli should be regarded as capable of propagating tuberculosis. Individuals may eliminate and cast them off by the normal avenues (bile and excrements), as I have demonstrated with C. Guérin. They are carriers and intermittent disseminators of bacilli and are all the more dangerous in that they arouse no suspicion in those about them." And on the following page we read, "The attenuations observed in experimenting with certain cultures are, therefore, only apparent and result from environmental influences."

From the observations referred to above, we cannot but adopt in 1927 the attitude taken by Calmette himself in 1923 and consider that in the present state of our knowledge we are not justified in using B.C.G. for vaccinating infants against tuberculosis.

A. BRANCH

REFERENCE

1. PETROFF, S. A., BRANCH, A., AND STEENKEN, W., JR., *Proc. Soc. Exp. Biol. & Med.*, 1927, xxv, 14.

THE MOSQUITO NUISANCE IN WINNIPEG

We are pleased to note that owing to the efforts of Dr. Speechley and the Natural History Society of Manitoba, an expert committee was appointed to report on the feasibility of accomplishing a successful anti-mosquito campaign in the Winnipeg district. After some investigation the expert committee pronounced the campaign to be advisable, although the prospect of a complete and effectual mosquito control was viewed with some pessimism. Much difficulty was experienced in reaching many of the breeding areas owing to the heavy rains rendering roads almost impassible. Nevertheless the result appears to have been very successful and mosquitoes were much less in evidence than in previous years. Undoubtedly the best method of controlling the development of mosquitoes is the drainage of the breeding area. The State of New Jersey has recommended this practice although the cost is always about four times the cost of one year's oiling. If mosquitoes are a nuisance on private property the owner can be compelled by law to abate the nuisance. This means that the owner may be compelled to drain any portion of his property of a marshy character, and thus prevent it serving as a breeding place. The following conclusions were arrived at after the season's experience. All that is needed for the control of the mosquito nuisance is to ascertain the breeding areas and oil them. Mosquitoes do not fly far from their breeding place as a rule. Where oiling is necessary oiling the breeding areas twice in one season, namely on or before May 15th, and June 15th will be sufficient to control the pest.

A SUGGESTION FROM VANCOUVER

The last presidential address delivered to the Vancouver Medical Association by Dr. A. B. Schinbein strikes a note which is not unfamiliar to those interested in the development of medical societies. After reviewing the stages of his Association's growth from a membership in 1898 of fifteen, to its present number of 201 active and 15 associate members, he pointed out with regret the comparatively little interest taken in the activities of the Association by the majority of its members. Poor attendance at meetings was the significant index of this lack of interest.

There are probably presidents of other medical societies in the Dominion who at times have to deplore that their support was lukewarm. It may be of interest to such to note how Dr. Schinbein proposes to deal with the situation. "An association," he says, "cannot progress unless new responsibilities are assumed. The taking of a new responsibility acts like a stimulant, increasing in every way the activity of the individual organization. If our Association is just drifting along, if there is a lack of interest in the Association on the part of our members, then let us stimulate it by making our members shoulder new responsibilities."

The responsibility suggested was the building of a permanent and more attractive home for the Association, one of which the members would be proud; one which would afford space for reading rooms and committee meetings and for the adequate housing of their library which now contains over 4,000 volumes and 63 current journals, and for their growing museum. This is a suggestion which should appeal to other associations in the Dominion. There may be some which are fortunate enough to be creditably housed, but there are probably more whose activities could undoubtedly be invigorated and widened by their possession of a suitable home.

The Nova Scotia Tuberculosis Commission has published in an attractive pamphlet the report of the Commissioner, Dr. Joseph Hayes, on a study-visit which he made last summer to a number of health organizations in Canada and the United States, together with a suggested plan of organization for Nova Scotia. Dr. Hayes submits an interesting résumé of what is being done at each of the places he visited, and the information he has collected will prove of value, not only to his Commission, but to all who desire to be *au fait* with the tuberculosis programmes of other communities. For Nova Scotia, he suggests a division of the province into five districts. One of these could be served from the Nova Scotia Sanatorium, at Kentville. For each of the others he advocates a travelling clinician and a travelling nurse whose duties would include the holding of clinics at various centres, and the finding of cases. More hospital accommodation is needed, and it is urged that this could be most logically provided by special annexes to existing general hospitals. For proper supervision of patients being treated at their homes, it is recommended that at least one public health nurse should be employed in each county—to assist the attending physician, to show patients how "the cure" should be taken, to instruct others in respect of preventive measures, to keep an oversight of school children, to maintain records, etc. Dr. Hayes reports progress in merging scattered tuberculosis councils into county organizations, and states that at the annual meetings of municipal councils, which take place in January, the effort is to be made to induce municipal authorities to assume responsibility for the hospital treatment of indigent tuberculous persons and to co-operate in the construction of annexes to hospitals.

A short and simple ceremony of interest to lovers of Dickens took place at the British Medical Association House, Tavistock Square, London, on October 12th, when the Council of the Association and members of the Dickens Fellowship stood on the site of Tavistock House, in which Dickens lived from 1851 to 1860, and an inscribed stone marking the site, above a portion of the old foundation, was unveiled.

The Rockefeller School of Biochemistry in the University of Oxford has been opened by the Right Hon. Viscount Cave, G.C.M.G., Lord Chancellor of England and Chancellor of the University, on Friday, October 21st, at 3.30 p.m.

We would direct attention to the case report from Dr. Walter on the use of the solution of tannic acid as a dressing for raw and denuded surfaces.

Men and Books

THE CADUCEUS

By W. H. Hattie, M.D.

Halifax, N.S.

Even in these latter days there are some who do reverence to the serpent. A custom, very common in the early days of mankind, of employing the serpent in religious rites is, we are told, still adhered to in certain isolated places where native simplicity remains content with non-camouflaged paganism. Seemingly the wiliness of this much be-ribbed reptile caught the fancy of man in very remote times, and the trail of the serpent can be traced through the religious practices, the mythologies and the traditions of many widely separated peoples. And while it has lost such general favour as an object of adoration, the evidence of its early predominance persists in symbolism which is quite familiar to us.

This survival is notable in view of a prejudice which has existed since B.C. 4004 (Usher's chronology—not mine) when a serpent exercised its subtlety in the Garden of Eden, to the discomfiture of all succeeding generations.

In days when priest, medicine-man and magician comprised a trinity, and the serpent was invested with the attributes of a god, he who would venture to heal a man of his infirmities without the guiding presence of the serpent would have exemplified the extreme of rashness. We unashamedly admit that medicine has evolved from that trinity, and rather proudly feature the serpent in the emblem which is very generally adopted by the profession. But we are in a quandary as to whether the emblem should have two snakes or only one.

The caduceus which the sculptor has placed in the hand of Mercury is doubtless a modification of the original Greek herald's staff, which we are told, was a plain rod entwined with fillets of wool. Later the fillets were replaced by serpents. Ovid entrances us with a little tale from which we gather that Mercury once attempted to stop a fight between two snakes by throwing his rod at them, whereupon they twined themselves contentedly about the rod—and lo! the emblem. This may be but pleasant fiction. If it be true, it explains why the caduceus symbolizes peace. Fondness for peace is admitted to have ever been

a striking characteristic of the medical profession. The wings are seemingly a comparatively modern addition, and may symbolize the union of two primitive cults of healing. But we must be cautious about accepting the caduceus as a true medical emblem. While Mercury's patronage of the sciences may have given him an interest in medicine, he is remembered particularly as the god of traffic and commerce, and his winged rod is claimed as a symbol by the devotees of those pursuits.

If the gods of old had been more considerate of the men of later days, and had left a record of dates to which we could ascribe their activities, we might be able to clear away some of the haziness which obscures the genesis and evolution of the caduceus. As it is, we must pin faith to the teachings of our archæological friends for the data and interpretations of data upon which we base our surmisings. By them we are informed that the neolithic age was characterized by the development of a culture which bears the strange name heliolithic. Perhaps fifteen thousand years before the Christian era—in the matter of dates let us be at least as cautious as Mr. H. G. Wells—this culture was in process of distribution from its seat of origin about the Mediterranean and in northern Africa throughout the warmer regions of the earth. Its brown skinned exponents, the most cultured people of the time, established a vogue for sun-worship and favoured huge monoliths for monuments. If they did not originate the highly meritorious custom of putting a man to bed when a child was born to him, they seemingly devoted themselves to its popularization. They gave evidence of a hygienic sense in their adoption of the practice of circumcision. And although the swastika was their favourite emblem it is quite possible (again we exercise Wellsian caution) that, out of their association of sun and serpent in religious symbolism, the caduceus was eventually developed.

It is customary to trace the beginnings of a definite civilization to this heliolithic culture. Conspicuous among the remains of even the earliest communities which excavations reveal are the temples, where the oldest medical records are found. These records and the temple decorations both give evidence of the reverence in which the sun and the serpent were held in pre-historic times. We of to-day are renewing enthusiasm for the sun; we have some information about its ultra-violet rays. We have less enthusiasm for the serpent, although we cherish its symbolism. The years that have passed since medicine ceased to be a perquisite of the pagan priesthood have not robbed us of interest in the traditions and practices of the early exponents of the healing art.

A vase which was unearthed at the site of Lagash, and which, according to the interpreters, had been dedicated by the King Gudea to the god Ningishzida about 3500 B.C., bears what is believed to be the oldest existing representation of the caduceus. Since that time it has undergone many modifications, but even the familiar winged wand of Mercury can boast considerable antiquity. It is difficult to say when this latter device came into use as a medical emblem. Early in the sixteenth century a medical publisher, Froben, adopted a title page design which shows two curly tailed, unusually fierce serpents entwined about a stout staff which is held in the grasp of two sturdy hands. Atop the staff and between the heads of the serpents is a bird (?hawk) whose gaping mouth and uncertain poise suggest extreme alarm. But the wings are not spread. Sir William Butts, a physician of Henry VIII, used a somewhat similar device on his crest. Seemingly, however, the single serpent on a staff, which met the needs of Æsculapius, has been generally regarded as a more fitting emblem for the medical profession. The badge of the Royal Army Medical Corps, and of other medical corps within the British Commonwealth, shows a staff with but one serpent entwining it. The same is true of the badge of the French medical service. Some twenty-five years ago, however, the United States Army Medical Service adopted a device containing two serpents, and the somewhat common acceptance in America of Mercury's winged wand as a medical emblem may be a consequence. It is very doubtful if this is justifiable.

Among the varied duties of Mercury was the conduct of the dead down the dank ways to the mead of asphodel in the dark realm of Hades. Why should we warm to him? But his half-brother, Apollo, warded off disease and healed the sick. And was he not the sire of Æsculapius? In at least one statue he stands beside the trunk of a small tree around which a serpent is twined. Here we get a much stronger resemblance to the stout serpent-encircled staff of Æsculapius than anything to be seen in the hands of Mercury. Unless Mercury filched the caduceus from Apollo as he is reputed to have appropriated, *inter alia*, the trident of Neptune and the girdle of Venus, we are without refuge of reason for believing that it was ever in line for inheritance by Æsculapius, and therefore by us. Why, then, should we take the chance of involvement in a legal squabble by snitching an emblem to which we have doubtful right when no one can dispute our claim to the staff and single serpent which sufficed for Æsculapius?

In a short play of Ben Jonson's (Mercury Vindicated), Mercury is made to say: "You might wrest the caduceus out of my hand to the adultery and spoil of nature." If so tragic a consequence might be attributed to our interference, it is submitted that there is so much the more reason for resigning any scrap of claim we may have to the herald's staff.

MILE STONES IN THE EVOLUTION OF OBSTETRICS*

By J. D. McQueen

Winnipeg, Man.

Obstetrics is an ancient art. It dates from the earliest existence of mankind upon this sphere and probably began outside of the Garden of Eden. From the earliest dawn of history, here and there, we are able to pick up fragments of records, which give an inkling of the now well recognized principles that were observed in those early times.

The earliest known record of parturition is found in the book of Genesis where Rebecca's delivery of the twins Esau and Jacob is described as follows:—"And the first came out red all over, like a hairy garment; and they called his name Esau. And after that came his brother out and his hand took hold on Esau's heel, and his name was called Jacob." The frequency of the premature birth of twins, the hairiness and redness of the premature child, are well known truths today.

In the same book we have a record of spontaneous version occurring in the birth of Tamar's twins; "And it came to pass in the time of her travail, that, behold, twins were in her womb, and it came to pass when she travailed that the one put out his hand and the midwife took and bound upon his hand a scarlet thread saying, this came out first. And it came to pass as he drew back his hand, that behold his brother came out and afterward came out he that had the scarlet thread upon his hand." In the tragic death of Rachel we have our first example of neglect at childbirth. In that distant past, intuitive obstetrical practices were probably as well developed as was possible with the complete ignorance of anatomy and physiology. Old women who had borne many children, began to assist the younger during delivery and to instruct others in the art. The more ingenious and adept, no doubt, created a local demand for their services, and these women became known as midwives.

The earliest date at which the midwife is mentioned is 1725 B.C., at Tamar's delivery, before mentioned. For 3,500 years the midwife played the leading role in the art of obstetrics. It must be confessed that throughout these centuries they contributed little of real worth to the advancement of obstetrics. In earliest times when in difficulty they called upon the priests for spiritual aid; later, priests were asked for mechanical aid, as well. With the advent of Greek medicine physicians were called upon by midwives when delivery was impossible. Midwives throughout the ages seem to have resented any encroachment upon their pre-empted field by physicians; to them, the physician was useful only, to perform mutilating operations upon the undeliverable child. Some idea of this bitterness may be imagined when one remembers that Mrs. Nihell, the Haymarket midwife, called Smellie "A great horse godmother of a he-midwife."

The midwife was not alone in her resentment. The public by their attitude towards male accoucheurs prevented science from forming the basis of obstetric art. Dr. Wertt, of Hamburg, as late as 1522, was burned alive for donning a woman's habit and observing a case of labour. To come nearer home John Hunter was compelled to remain in an adjoining room while Mrs. Stevens brought George IV into the world. Dr. Baillie, who refused to have a midwife assist him, together with Sir Richard Croft as consultant, officiated at the confinement of Princess Charlotte, in 1817. Both mother and child died. Had the child lived it would have occupied the throne of Britain. Mortification over the outcome caused Croft to shoot himself. The effect of the whole affair will be realized when one learns that in the following year a German mid-wife was sent for to officiate at the birth of Queen Victoria.

In all fairness, it must be stated that many midwives, considering their meagre knowledge of fundamentals, did accomplish much by their art. One name in particular stands out—that of Louise Bourgeois, really a pupil of Ambroise Paré. She stood in high favour at the court of France, and in her declining years after much experience and appropriation of some of Paré's teachings, produced in print much that was of benefit to other midwives. During the last hundred years the trained physician has gradually taken his place as accoucheur, and the midwife, though not extinct, is slowly disappearing.

Hippocrates, the father of western medicine, included obstetrics in his teachings. Though he had little knowledge of the anatomy of the pelvis or the mechanism of labour, his teaching and writings meant a change in practical obstetrics. Many of his shrewd observations and conclusions stand to this day. He dissociated religion and medicine and soon the physician was called upon to remove the fœtus which could not be delivered by the midwife. His teaching was disseminated far and wide, and laid the foundation for many centuries to come. The Aphorisms of Hippocrates dealing with pregnancy and delivery are known to many. His observations covered many phases of obstetrics—sterility, painless hæmorrhage during pregnancy, presentation of the fœtus, intra-uterine death of the fœtus, prolapse of the cord, pelvic inflammation and its treatment. For lavage of the uterus he advised the use of mare's milk, boiled twice, and strained. He advised cleanliness of the clothes worn, and also of the hands. Rain water, boiled to purify it, was the most suitable, he said, for washing the hands. These last admonitions were disregarded for many, many centuries.

The most distinguished of the ancient writers on obstetrics was Soranus of Ephesus, who lived in Rome early in the second century. "His

*Presidential address Manitoba Medical Association meeting, Winnipeg, September 12, 1927.

writings and teaching mark the highest development of the obstetric art in ancient western civilization. Fathered by Hippocrates, fostered by Celsus, it was perfected by Soranus with whom independent original work and progress ceased for fifteen centuries" (Engleman).

His writings were practical, giving detailed instructions in gynæcology, obstetrics and pediatrics. He showed how midwives might improve their technique and methods and how the new born infant should be cared for. Ophthalmia neonatorum was observed and to prevent it he recommended cleansing the eyes of the newborn. As causes of prolonged labour, he discusses premature rupture of the amniotic sac, atonia of the uterus, a full bladder or rectum and contracted pelvis; apparently he also recognized the male type of pelvis. He used postural treatment for prolapse of the arm. He was the first to advise support of the perinæum during delivery of the fœtal head. Though he realized vertex delivery was best, in certain malpresentations he advocated extraction by the feet, and to him must be given credit for paving the way for podalic version.

From the time of Soranus until the middle of the sixteenth century the art of obstetrics made no advance. If there was any change it was for the worse, and it must be confessed that through "the middle ages" obstetrics consisted in "neglect of the normal, and butchery of the abnormal cases." True, during this period two obstetrical works came into being. *The Rosegarten* of Eucharius Röslin appeared at Worms, in 1513, and was more or less duplicated in our own language, in 1545, by Thomas Raynalde, under the name *The Byrthe of Mankynde*. These publications were founded upon the writings of Soranus and contained little new.

During the sixteenth century the renaissance not only of midwifery but of western medicine took place. Padua, the reputed resting place of the bones of St. Luke, was at this time the most distinguished university in Europe. From this centre of learning emanated the principles which were to make medicine in all its branches a science as well as an art. Of the Paduan teachers, to whom we owe so much, probably Vesalius and his successor Fallopius were the most distinguished.

In addition to the impetus given to medical learning by the Paduan school at this time, another and independent source of advancing thought arose in France. Surgery and midwifery in particular were placed on a much higher level owing to the untiring energy and the teaching and writings of Ambroise Paré. Paré, by sheer professional ability, made himself indispensable to the élite of France, and by his personal charm and generous nature became the sought after companion and friend of those worth while at the court of France, and in this way did much to raise the social status of the surgeon and physician. This man of humble origin, by dint of hard work, courage and full use of nature's mental endowment, rose to the highest pinnacle of the profession in France. His life history reads like a romance and even the most blasé must admire his ability, honesty, humility and generosity. By royal command, he remained near the King, and was thus saved from a tragic end on the night of St. Bartholomew.

During his many campaigns he revolutionized war surgery. During his long and successful practice in Paris he taught many improvemen s in the art of obstetrics. Though not claiming originality, we owe to him the revival of podalic version and breech extraction. His detailed description of these procedures were most complete and lucid. He originated the premature induction of labour in cases in which the mother's life was jeopardized by the continuation of the pregnancy. A collection of his works were first published in 1515, and in that portion entitled *The Generation of Man* his obstetrical principles are laid down. These works published in French marked a new era for surgery and obstetrics. Personal experiences combined with a knowledge of the science of surgery and obstetrics replaced the theoretical and traditional dogma of centuries.

We now turn to one of our own kith and kin, William Harvey, one to whom medicine of to-day pays just homage as one of the outstanding names in medicine of all time. Apart from many well known contributions to medicine, he definitely laid the foundation for our knowledge of embryology, and of the physiology of pregnancy, parturition and the puerperium.

At the age of 22, William Harvey went to Padua and was there imbued with the spirit of the great teachers of that university. Upon his return home he continued with renewed vigour the work in which he had become interested in Padua. No one dare even guess what this man might have accomplished had the facilities at our disposal to-day been his. With his simple lens or "perspective," as it was then called, the accurate, minute and ofttimes original details observed in the almost daily dissection of the embryos of birds, animals and man was nothing short of miraculous. He made many dissections of human embryos of all sizes "from the bigness of a tadpole and so upwards to the birth." His careful observations and descriptions of the fœtus and its viscera at various ages, as published in *Generation*, commands our warmest admiration. His essay on childbirth, *De Partu*, is the first original English work on midwifery.

The scientific part of the work is based upon his own observations, and by them he eliminated many previous opinions on the anatomy of the fœtus and the physiology of pregnancy and parturition. He advocated patient watchfulness and gentleness, the imitation of nature in ordinary cases, and podalic version in difficult ones. He was the first to accurately describe the fœtal circulation; he discussed the lie of the fœtus and length of pregnancy; breech delivery and involution; and said there was no direct communi-

cation between the maternal and fœtal circulation. The following extract will give you some idea of his obstetrical outlook. "If you carefully ponder nature's works, you shall find none of them in vain but all directed to some end and some good." He rebuked the younger, more giddy and officious midwives, who, "lest they should seem unskilful at their trade, do mightily bestirre themselves and provoke the expulsive faculty by medicinal potions, whereby they rather retard and prevent it, and make it an unnatural and difficult delivery and, vainly persuading the woman to their three leg stoole, weary them out and bring them in danger of their lives. It is much happier with poor women, and those that dare not own their great bellies where the midwives help is never required, for the longer they retain and retard the birth, the easier and more successful proves the delivery."

During the seventeenth century obstetrics made much headway, and the profession began to take more interest in the science and art of midwifery. The influences of the teachings of Paré in France, and Harvey in Britain, were having their effect. The French school in particular was active, with Mauriceau and La Motte as the outstanding teachers and authors. Mauriceau is said to be the first physician to devote himself exclusively to the study and practice of obstetrics. Van Deventer in Holland at the end of the century did much to raise the standard and to him we owe a debt for the first clear and concise description of the mechanism of labour.

Peter Chamberlen, in the first half of the sixteenth century, invented the obstetrical forceps, but as the succeeding generations of the Chamberlen family tried to keep their invention a secret and attempted to sell it from time to time for financial gain, it was almost two hundred years before this instrument became generally known to the profession. In a hidden attic of a house in Essex, for many generations in the possession of the Ingraham family, the original Chamberlen forceps is said to have been found in 1815.

Many improvements have been made upon the original invention; many of these modifications bear the names of the most illustrious obstetricians of the eighteenth century. Unfortunately, the abuse of this instrument, as a dilator and cork screw, has been great, nevertheless its skilled use has been of tremendous benefit to the practice of midwifery.

During the eighteenth century steady progress was made and science gradually took its proper place along with art in obstetrics. "Obstetrics was divorced from its intimate connection with surgery and also disencumbered from the trammel of ignorance, superstition and empiricism which has so greatly retarded its progress." Of the many whose names became outstanding there was Smellie and Wm. Hunter in Britain, Auld in Dublin, Baudelocque in France, and Roderer in Germany.

Smellie, a pupil of the French school, after his return to London, began to teach obstetrics in his own house using a leather-covered manikin for his demonstrations. He improved the obstetric forceps, and in his book *Midwifery*, he laid down rules for its use. He also differentiated the contracted pelvis from the normal pelvis by actual measurement.

Wm. Hunter was a pupil of Smellie. Unlike his teacher, Hunter opposed the use of forceps. Wm. Hunter, perhaps overshadowed in some respects by his illustrious brother, stands out as the leading obstetrician and consultant in London at that time. His marvellous work *The Anatomy of the Human Gravid Uterus* is a classic known to all. A retro-displaced gravid uterus when seen, even to-day, immediately brings to mind Hunter's drawing and description of that condition. He laid the foundation for modern knowledge of placental anatomy and physiology.

Then came a black page in the history of obstetrics—thousands of young mothers were dying from puerperal infection. For almost one hundred years the medical profession refused to listen to, or accept the teachings, warnings and pleadings of a few pioneers that puerperal fever was contagious. The profession seemed to resent the implication that it was possible for them to be responsible for the transference of infection from one patient to another. Not until the blame was placed upon medical students would the profession as a whole, accept the theory. For this reason Semmelweis has, it seems to me, received more than his share of credit as being the first to bring before the medical world the fact that puerperal fever could, to a great extent, be prevented. He believed that decomposed animal matter only, brought into contact with the genitalia of the parturient woman, could cause the fever and deprecated the belief of a few, particularly in Britain, that the disease was contagious.

Before the time of Semmelweis, (his publication appeared in 1860) free ventilation, absolute cleanliness of lying-in wards, disinfection of the hands, and abstinence from practice if previously in contact with many cases of puerperal fever, were growing principles in various centres of Britain. The late Dr. Adami, in his Lloyd Roberts Lecture of 1921, in no uncertain language brings out many of these points and attempts to place honour where honour is due.

True, we owe a great debt to Semmelweis for driving home the nail at a psychological moment of receptiveness in the profession, but we cannot hold that his theories correspond as nearly to present day understanding as did those of several British clinicians and at least one in America.

To Charles White, of Manchester, must be given credit for first drawing the attention of the profession to the necessity of good ventilation and clean surroundings in the prevention of puerperal fever. His work first appeared in 1773. In it he says, "In hospitals, if separate apartments cannot be allowed to every patient at least as soon as the fever has seized one, she ought immediately to be moved into another room, not only for her immediate safety but that

of other patients; or it would be still better if every woman were delivered in a separate ward and was to remain there a week or ten days, until all danger of the fever is over. Whenever a patient has recovered from the fever and is removed to another room, the bedding and curtains should be washed, floor and woodwork should be cleansed with vinegar and even better if it were stoved with brimstone."

Gordon of Aberdeen published a treatise on puerperal fever, in 1795. May I quote from it: "This disease seized such women only as were visited or delivered by a practioner or taken care of by a nurse who had previously attended patients affected with the disease. I had evident proofs of its infectious nature, and that the infection was as readily communicated as that of smallpox or measles." He admitted that he himself was responsible for carrying infection in some cases. Collins of Dublin, in 1835, published his treatise in which he described the absolute elimination of puerperal fever from his wards by disinfection of wards, beds, linen, etc., by chloride of lime.

In 1843 Oliver Wendell Holmes published his essay on *The Contagiousness of Puerperal Fever*. With few exceptions, abuse was all he received at that time from his confrères. It was not, however, until the antiseptic principles handed down by Lord Lister in 1867, were given to the profession, that the hopes of all these pioneers were realized. It was the "one thing needful," and might well have been in the mind of Browning when he wrote "Oh! the little more and how much it is, and the little less and what worlds away." It revolutionized obstetrical methods. Puerperal fever still exists, but is now considered preventable.

Sir Jas. Y. Simpson, in 1847, first used ether during parturition, but soon substituted chloroform as a more suitable anæsthetic for childbirth. This marked a new and great advance in midwifery. From this beginning numerous methods have developed in the endeavour to lessen pain during parturition. Simpson improved the obstetrical forceps; the type bearing his name is the most popular even to-day. The uterine sound and sponge tent are products of this ingenious obstetrician. He strongly advocated version in deformed pelves.

Credé, of Germany, a little later explained how the placenta could be removed by external manipulation. He is responsible for the use of silver nitrate in the eyes of the newborn.

Braxton Hicks gave to us the combined external and internal method of podalic version. He described the condition of the uterus during labour, and, in 1872, recognized and gave the name to concealed accidental hæmorrhage.

Many names, well known to all, come to mind in considering the great teachers of our own time. The great advance of the last fifty years has taken place in the last twenty, in the form of prenatal care. Ballantyne, of Edinburgh, stands out above all others in that he struck the keynote of prevention in obstetric practice, and laid down definite lines for the profession to follow with this end in view.

As in the last twenty years prenatal care has come to the fore, so in the next twenty years, postnatal care will result in another move forward towards making obstetric practice meet the ideal of a healthy, happy mother and child.

[This address has been slightly abridged, by the omission of the peroration.—Ed.]

THE TIBETAN BOOK OF THE DEAD*

By Albert G. Nicholls, M.D.

Montreal

The plain reader, taking up this book for the first time, is likely to recall the sibylline warning, *Procul, procul, esto profani.* The chief impression that one gathers from its perusal is a sense of abstruse mysticism and a decided remoteness from Western moulds of thought. The work, as an epitome of the essential doctrines of Buddhism, of the Mahayana school, is of much importance, religiously, historically and philosophically. The editor, Dr. Evans-Wentz, indeed, regards it as a contribution to the science of death, of existence after death, and of rebirth, which is unique among the sacred books of the world, one of the most remarkable gifts that the West has ever received from the East.

For the Buddhist, life consists in a series of successive states of consciousness. The first is the Birth-Consciousness; the last, or Death-Consciousness, is that existing at the moment of death. The interval between 'death' and 'rebirth' is the intermediate state or Bardo, during which 'old' things become 'new'. The book, therefore, is a Traveller's Guide to Other Worlds, and belongs to a definite class, in which we may include such works as, the *Egyptian Book of the Dead*, the *De Arte Moriendi* and similar mediæval treatises, the Orphic manual, the *Descent into Hades* (cf. "He descended into Hell"), the *Pretakhanda* of the Hindu Garuda Purana, Swedenborg's *De Coelo et de Inferno*, and Rusca's *De Inferno*. In Tibetan it is called *Bardo Thödol*, which being interpreted, means 'Liberation by Hearing on the After-Death Plane.' The English title, *Book of the Dead*, is not, therefore, a literal translation, but has been adopted by the editor as the most suitable for conveying to the English reader the true character of the book as a whole.

It may be asked, "Of what interest is such a book to the medical profession?" The physician is concerned with this life and with material things, not with the future state and things imponderable. Yet, there has always been a somewhat intimate connection between medicine and religion. Ailments, like the good things of life, came from the gods. Originally, priest and

* *The Tibetan Book of the Dead.* W. Y. Evans-Wentz, M.A., D.Litt., B.Sc. 248 pages, illustrated. Price $4.75. Oxford University Press, Toronto, 1927.

physician were one, and there are not wanting modern instances of what Cotton Mather called "the angelical conjunction." Indeed, the boundaries of soul, mind, and body are not clearly defined, and, accordingly, the physician has always been something of a philosopher. He may even be religious, despite the ancient gibe—*Tres medici, duo athei.* The important relation between present and future is emphasized in this quotation from *The Book of the Craft of Dying:* "Learn to die and thou shalt learn to live, for there shall none learn to live that hath not learned to die." There are, however, more intimate contacts between the Bardo Thödol and Medicine than these, as we shall see.

The *Tibetan Book of the Dead,* dealing as it does with most abstruse problems, and often couched in mystical language the key to which has been handed down in the past by oral communication, could hardly have been adequately rendered by a Western mind, and we owe the English version to a man remarkable for his learning and piety, who with an excellent knowledge of English combined an illuminating sympathy with his task, the Lama Kazi Dawa-Samdup. He was successively Chief Interpreter on the staff of His Excellency Lonchen Satra, the Tibetan Plenipotentiary to the Government of India, an attaché on the Political staff of His Holiness the Dalai Lama on his visit to India, and, later, Lecturer on Tibetan in the University of Calcutta. The work is fortunate in its learned editor, also, Dr. Evans-Wentz, who has contributed interesting and valuable comments, as well as an excellent analytical introduction.

Structurally, the *Bardo Thödol* is based on the number forty-nine, the square of the sacred number seven. There are seven worlds or seven degrees of phenomenal experience. On each globe there are seven rounds of evolution, making forty-nine stations of active existence. Its language is sometimes literal, sometimes symbolical, so that it is not fully intelligible except to the adept.

It is worth noting that the Buddhists, like ourselves, conceive of the world as originating in fire. The other elements, air, water, and earth are formed later in regular succession. Of these four the body of man is composed. The various passions of man correspond to and are derived from these original substances. We are inevitably reminded of the four elements of Empedocles, "the roots of all things," the doctrine which entered so largely into the physiology and pathology of Hippocrates and Galen and tinctured the conceptions of disease for more than two thousand years. The Buddhists, however, add a fifth element—Ether—, symbolized as "the Green Light-path of the Wisdom of perfected Actions," which does not dawn till after death and when the Wisdom Faculty has been perfectly developed. For the Hindu and Tibetan, as for the Greek, man is the microcosmos, an epitome in little of the macrocosmos or universe.

The *Book of the Dead* gives in striking detail the signs of impending dissolution, for the information of the sick person, officiating priest, and attendants. It is important that the dying man should retain consciousness into the very article of death. If he seems likely to drop off into a sleep the arteries are pressed upon to prevent this. There are nine apertures in the body, the nine channels of Experience, through which the soul may escape. The most worthy is on the crown of the head at the sagittal suture—the Brahmarandhra or Aperture of Buddha. After death the body is tied up in a sitting position, sometimes called "the embryonic posture," symbolical of the birth from this life into the next. The book gives the appropriate ritual, and deals with the after-state, the judgment, punishments and rewards, and the mechanism of the rebirth. We can again find a striking analogy with Greek philosophy, in the tenth book of Plato's *Republic,* where certain of the Greek heroes are depicted as choosing their bodies for the next incarnation. As the Greeks were a comparatively early offshoot from the primitive Aryan stock one wonders whether they arrived at the idea of metempsychosis independently, or whether, rather, they did not carry over an inheritance from the philosophy of their past.

Briefly stated, the Buddhist idea underlying the doctrine of rebirth is this. All states of phenomenal (sangsaric) existence, heavens, hells, worlds, natural and supernatural beings, are transitory, unreal, and non-existent. They are a figment of the mind due to a yearning after sensation. So long as this yearning is not overcome by Enlightenment, death follows birth, and birth death, unceasingly, as, indeed, Socrates believed. After-death existence is only a continuation, under altered conditions, of the world-life, both states being character-forming (karmic). The nature of life in the intermediate state between death and rebirth is determined by the antecedent actions of the individual. Unless Enlightenment be won, and this must come about by one's own efforts (unlike the teaching of Christianity), rebirth into the human world is inevitable. The succession of existences, whether in this world or the other, will continue until liberation from the shackles of phenomenal existence is obtained through morality, devotion, and knowledge. Freedom is the attainment of the void, or Supreme State (Nirvana). The Nirvana represents supreme felicity, the attainment of Buddhahood; it exists, but it cannot be defined, as it is the negation of all determinations. It is the Alogical, unknown in form to finite experience.

It is important to note that the Buddhist theology, unlike the Christian, definitely teaches the doctrine of evolution. Thus, Hinduism recognizes 8,400,000 graded kinds of births, culminating in man. The attainment of the Supreme Perfection can only be obtained through rebirth in man. Man may, however, be reborn with well-marked animal propensities, and, if so, enlightenment is by so much delayed. In the most flagrant cases man may be reborn in some

sub-human form, and then the attainment of Enlightenment is painfully hindered, as the whole process of evolution from that point must be gone through again.

Dr. Evans-Wentz, in *The Fairy Faith in Celtic Countries*, apropos of this train of thought, wrote as follows: "the rebirth doctrine, in its straightforward Druidic form, accords, in its essentials, with the psychological science of the West—that the subconscious mind is the storehouse of all latent memories; that these memories are not limited to one life-time; that these memory-records, being recoverable, prove the doctrine to be based on demonstrable facts." Huxley (*Evolution and Ethics*, London, 1893, 61-2, 95) is quoted as holding that the theory of human incarnation offers the best explanation of even ordinary biological phenomena. His words are: "Everyday experience familiarizes us with the facts that are grouped under the name of heredity. Every one of us bears upon him obvious marks of his parentage, perhaps of remoter relationships. More particularly, the sum of tendencies to act in a certain way, which we call 'character', is often to be traced through a long series of progenitors and collaterals. So we may justly say that this 'character'—this moral and intellectual essence of a man—does veritably pass over from one fleshly tabernacle to another, and does really transmigrate from generation to generation. In the new-born infant, the character of the stock lies latent, and the Ego is little more than a bundle of potentialities. But, very early, these become actualities: from childhood to age they manifest themselves in dullness or brightness, weakness or strength, viciousness or uprightness; and with each feature modified by confluence with another character, if by nothing else, the character passes on to its incarnation in new bodies. The Indian philosophers called character, as thus defined, 'Karma.'

The temptation is great to draw some parallels and contrasts between the Buddhists' teaching on certain points and those of the Christian Scriptures, but lack of space forbids. Much of the symbolism of Jewish and Christian writings is similar to that of the Egyptian and other Eastern religions, and may have been derived from these sources. At any rate, it argues for an identical intellectual mould in these early races. The very evident parallels suggest, too, in the words of Dr. Evans-Wentz, that 'despite differences in race and creed, and of physical and social environment, the nations of mankind are, and have been since time immemorial, mentally and spiritually one.'"

Correspondence

Our Edinburgh Letter

(*From our own correspondent*)

Medical practice in the rural parts of Scotland has always been accompanied with considerable difficulty. The scattered nature of the populace, the long distances, the stormy seas, and the pestilential perversity of the climate, have combined to make the doctor's daily task no easy one. The advent of the motor car and motor boat have revolutionized matters to a great extent, and medical aid is now available to all in even the remotest districts, through the grants paid from the Highlands and Islands fund to doctors. The early death registers of sixty and seventy years ago are mute witnesses to the numbers who formerly died without medical attendance. In those days Lewis, an island of 492,800 acres with a population around 27,000, depended for its medical treatment on one doctor living in Stornoway. There, in a country innocent of roads, visits could only be made by boat or along straggling pathways over bog and heather. A hundred years ago one doctor living in Uist the most northerly isle, ministered to the needs of the 28,000 Shetlanders, making a professional voyage round the island group twice a year in a fishing smack. Now all this is changed. Lewis has seven medical men to attend to the wants of its inhabitants, while Shetland, where transit is rendered more difficult owing to the numbers of islands, has fifteen doctors in addition to M.O.s. of H. and School Medical Officers. The Scottish Board of Health has harmonized conditions so that the present practitioners lead vastly different lives from their forerunners. Formerly, many of the medical men eked out a bare existence by farming, managing estates, and other sylvan pursuits. The grants now paid to doctors, in return for which they render professional attendance at a modified fee to the poorer people, have altered all this. Numbers of keen capable young doctors are being attracted to the Highlands and Islands and a most efficient and adequate service is provided. The stalwarts of the past served their day and generation both faithfully and well, but, the old order has changed, and, with the coming of new methods and fresh ideas, many difficulties that existed in the past have ceased to be. Some years ago the Scottish Board of Health initiated a new scheme. Duly qualified surgical specialists have been installed at Stornoway and Lerwick. These are paid a fixed salary and are permitted private practice in consultation with the general practitioners of the area. Formerly, with surgery in the hands of general practitioners, patients in need of surgical intervention, other than emergencies, had to face the long sea journey to the hospitals of Aberdeen Edinburgh or Glasgow. Such is now no longer necessary and only in exceptional cases do patients take the journey south. So eminently successful has the project proved of bringing scientific surgery to the islands that a similar scheme is contemplated for the Orcadian Archi-

pelago and other areas in the Highlands and Islands.

One of the most successful gatherings attended by the representatives of the British Medical Association last July was a special religious service at Rullion Green, on the Pentland slopes, one of the famous battlefields of the Covenanting times. Some 500 members attended the service, which was conducted by the Rev. Dr. Ratcliffe Barnet, Greenbank U.F. Church and the Rev. G. F. Macleod, M.C., St. Cuthbert's Parish Church. Dr. Ratcliffe Barnet in a short address recalled the history of the Covenanting times. The Covenanters were the men and women of the Scots Kirk, who, for fifty years in the 17th century (1638-1688), fought for religious liberty and won it. Apart from their countless skirmishes with the government troops, they fought three pitched battles; the first, at Rullion Green was a defeat; the second, at Drumclog, was a victory, and the third, at Bothwell Brig, was a tragedy. The ancient battleground amid the hills, and the wonderful vista over land and sea, bathed in a flood of sunshine, combined with the impressive nature of the proceedings to render the service most impressive. The singing of God Save the King at the close was very appropriate, reminding the "Sassenachs" who were there that though the Scots may like to linger in the past, they yet know how to be loyal in the present.

Some time ago, an anonymous gift of £100,000 was made to the University of St. Andrew's. Principal Sir James Irvine has now revealed the fact that the donor of this princely gift is Mr. Edward Stephen Harkness, of New York, an alumnus of Yale University. More than a quarter of the sum is to be devoted to the erection of a residential hall for men students A further portion is to be set aside for the establishment of scholarships for the students in residence. St. Salvator's College, as the new foundation will be called, is intended primarily to revive the old system of collegiate residence.

"The good old days," whose goodness is so largely conjectural, were recalled by Dr. William Robertson, the Medical Officer of Health for Edinburgh, at a People's Meeting recently. Edinburgh was not always the clean and healthy place it is to-day. There was a time when pestilence stalked unchecked through the streets, and when the stranger fled from the mephitic emanations of its gutters. Those were the days when "Gardyloo" (gardez l'eau) was shouted from the windows, when the Lawnmarket was choked with filth, and pigs and other live stock wandered about the streets at their own free will. There was a time when an attempt to improve the house drainage of the Canongate was met by violent opposition and was denounced as wanton waste of the ratepayers' money. For many years now, the worst sections of the city have been gradually cleared away. Edinburgh has now undertaken slum clearance and improvement schemes by which more than 25,000 persons will be transferred to better surroundings. Already we are reaping the benefits of former sanitary improvements. The infantile mortality has been almost halved since 1880, though it still stands at the terribly high figure of 80 per thousand. In the year 1900, there were 818 deaths from tuberculosis, while in 1926 with a much extended city and a greatly increased population the death rate was 482. The present day agitation, in favour of tuberculosis-free milk supplies, will confer still greater benefits on our successors

A book of notable interest appeared in Edinburgh during the summer. This is *A History of Scottish Medicine to 1860*, by Dr. John D. Comrie, Lecturer on the History of Medicine in the University of Edinburgh. The volume is issued by the Wellcome Historical Medical Museum. While several Medical Corporations and Universities have issued accounts of their individual histories, this is the first work dealing as a whole with the subject of Scottish Medicine and its many characteristic features. Here is shown the effect that various institutions and individuals distinguished in Scottish Medicine have exerted on one another and on the development of medical knowledge. The various influences of Padua and Leyden, and the close intercourse with Paris through the hereditary friendship with France, are here described. It is not to be wondered at, that, in the constant bickerings between King and Baron, Catholic and Calvinist, Jacobite and Whig, which is the tale of Scottish history, the progress of medical teaching should have suffered many interruptions. The gradual erection of the ancient corporations, and the establishment of medical faculties in the various universities, in the face of conflicting interests and many discouragements, is proof of the ineradicable thirst of the Scot for instruction and education. The stream of events from the early days of ecclesiastic hospitals is illuminated by the names of Hamilton, Munro, Home, Arbuthnot, Pitcairne, Cullen, Bell, Gregory, Duncan, Simpson, Christison, Liston and Syme, and so to Lister. The Medical Act of 1858 abolished apprenticeships and many of the privileges of the Medical Corporations, and the other provisions of the Scottish Universities Act came into operation about the same time. These are adduced as the reasons for terminating the history about the year 1860. Though the history emanates from Edinburgh Dr. Comrie is to be congratulated on dealing impartially with the various seats of Scottish Medical Teaching. The share of St. Andrew's, Aberdeen and Glasgow in the march of progress are all fairly and faithfully described. The book is profusely illustrated and many of the pictures are here reproduced for the first time. The value of the history is greatly enhanced by the inclusion of references to many other works. This book will make an appeal to the increasing number of persons who take an interest in the subject of Medical History and to them it can be recommended with every confidence.

GEORGE GIBSON.

23 Cluny Terrace, Edinburgh.

Our London Letter

(From our own correspondent)

Medicine and the Church.—Spiritual healing and faith healing have been attracting considerable attention during the post-war period in this country more especially from the scientific point of view, and psychologists have shown great interest. Following the British Association Meeting at Leeds this year, moreover, quite a fierce science versus religion controversy broke out, mixed up almost inexplicably with the new Prayer Book, and it is by no means over. It has therefore been refreshing amidst a maze of pronouncements by bishops, "brawling" in St. Paul's Cathedral and other incidents, to find the subject of medicine and its relation to the church treated in a quiet, restrained yet wholly satisfactory manner by Sir Farquhar Buzzard in the annual oration to the York Medical Society. (Incidentally it has just been announced that Sir Farquhar has been appointed Regius Professor of Medicine in the University of Oxford in succession to Sir Archibald Garrod.) He traced the historical association of medicine and religion showing how progress in medicine had been accompanied by a gradual separation from the church, and we now find that many men have almost transferred their faith, and worship in a temple of healing where they seek not for enlightenment but for authoritative pronouncements on food and drugs so that they may adopt a guaranteed ritual. The position is really becoming acute. Taking the courage of his profession in both hands Sir Farquhar Buzzard says "We make no claim to cure". This is the modern physician's honest belief. Will the church on the other hand lend the weight of its authority against any claim for spiritual healing in organic disease? The matter is complicated by the question of "functional" disorders especially of the nervous system, where the influence of the church is in some cases definitely for the good, hastening the natural cure of the patient. It is to be hoped that our spiritual advisors will read Sir Farquhar Buzzard's address and learn the real attitude of enlightened members of the profession.

The Strangeways Collection.—With his death on December 6, 1926, there passed away a very remarkable man, an astute observer and a great scientist in Dr. T. S. P. Strangeways, who was little known outside the circle of those who realized the importance of his work on the pathology of chronic rheumatic affections of the joints, and its outcome into the microscopic study of living tissue cultures. These remarks are prompted a year after his death by the recent addition to the museum of the Royal College of Surgeons of England of his collection of preparations and specimens, consisting of some 800 dissections and 3,000 microscopic sections, of which Mr. R. Lawford Knaggs, F.R.C.S. is compiling a descriptive catalogue. Strangeways entered St. Bartholomew's Hospital as a student in 1890 and partly because of an inclination for laboratory work and also because of increasing deafness he definitely took up pathology and became Huddersfield lecturer in this subject at Cambridge. Convinced that disease must be studied in the living as well as in the dead he obtained a certain amount of support for his ideas and was able to open his "Research Hospital" consisting of three beds in 1905 and there Strangeways began his inquiry into the changes occurring in the joints in chronic rheumatoid arthritis and osteo-arthritis. Shouldering most of the financial burden himself, but later accepting help from the Medical Research Council and from generous donors, he continued to extend his laboratories and in 1918 he began to publish the results of his painstaking investigations. From the growth of cartilage in the synovial fluid of joints it was an easy step to the cultivation of living tissues in artificial media, and this work is being carried on at the present day under Dr. J. A. Andrews. It is pleasing to note that the collection of specimens which was made by the pioneer in this field is to be maintained at the College of Surgeons under the name of "The Strangeways Collection."

New Hospitals and Institutions.—There have been several new buildings connected with the medical world opened during the past month. At Halton, near Wendover, Buckinghamshire, the Princess Mary's Royal Air Force Hospital was formally named the other day. This has accommodation for 200 beds for officers, men, women and children and is well constructed on the pavilion system. There is an isolation block close by and a special venereal disease section in a separate building. Accommodation for the nursing sisters is provided in a building about 200 yards from the main hospital. At the Cardiff Royal Infirmary new laboratories for the Medical Unit have been completed, the cost of building and part of the equipment having been provided through the generosity of the Rockefeller Foundation. The building is in five storeys in direct communication with the Infirmary and fully equipped for routine and research work. The wards are also connected with the laboratories by wires so that electrocardiographic work can be carried out without disturbing the patients.

The Middlesex Hospital has begun to rise again: the west wing which was pulled down last year as part of the big reconstruction scheme is now definitely under contract for its rebuilding and work has commenced. The

Courtauld Institute of Biochemistry, a magnificent building, is nearing completion on an adjoining site. Incidentally it has been decided that the cancer wing of the Middlesex Hospital, endowed by the Barnato-Joel foundation, shall in future be known as the Middlesex Cancer Hospital. This department has 90 beds solely for cancer patients, half of which number are reserved for operable cases.

ALAN MONCRIEFF.

London, December, 1927.

Letter from India

I have been having a perfectly wonderful time for the past two months, working on cholera with d'Herelle, the bacteriophage man. We have been particularly fortunate, as this year is decidedly a "cholera year." Cholera has been worse than usual in Bengal, its real home, and, besides, this year is what is called a "Khumb" year. Every 12 years a tremendous mela or festival is held by the Hindus at a little place called Hardwar near the spot where the sacred Ganges enters India. All the devout go there to bathe in the holy waters in April when the moon is in a certain phase. The town of Hardwar is normally a tiny place, of about, I should think, 10,000 persons. But on April 13th, this year, it was estimated that 500,000 people were there and during March and April several millions must have visited the spot. For miles around the town there were temporary houses, booths and tents, making the place a huge camping ground. The place is no less a resort of rogues of all sorts, thieves, pickpockets, abductors of women, many of whom dress in the yellow robes of the "sadhu," the dress of the truly devout. A railway man told me that on the days just before the great bathing day as many as thirteen trains an hour came into and left the station. You can imagine the task set before the police, railway and public health officials! This year there were only 13 deaths from accidents, when a bridge gave way, and only 6 deaths from cholera were recorded. Nevertheless cholera broke out in the Punjab in May, while it usually does not commence in an epidemic form until July when the rains begin. I have the figures for deaths from cholera in the Punjab since 1867, and in every "Khumb" year there has been an epidemic, so we are inclined to blame the mela for the outbreak this year.

D'Herelle and I started out to work on cholera in Calcutta in May, and we found out a lot of interesting things in connection with bacteriophage in cholera. In every fatal case bacteriophage is absent and in every case that recovers it is present. In Calcutta which is an endemic centre bacteriophage can be recovered from the stools of patients very soon after the onset of the disease, say in about 24 hours, if the patient is going to recover. It seems definitely to have to do with recovery.

3 cases; no bacteriophage; 3 died within 24 hours.
3 cases; bacteriophage feeble and then disappeared; 3 died within 24 hours after disappearance.
2 cases; strong bacteriophage on admission; 2 prompt recoveries.
13 cases; weak bacteriophage, the potency of which rapidly increased; 13 delayed recoveries.
2 cases; bacteriophage fluctuated in potency, but finally became strong; 2 delayed recoveries.

We then thought we should like to try the treatment of patients by means of bacteriophage, so we took the strongest races of phage we had from the two patients who recovered rapidly; passed them through other patients and increased their virulence for cholera vibrios.

Armed with the potent bacteriophage we then went to the Punjab where d'Herelle wished to study cholera in the epidemic form. You see, in Calcutta cholera is always present while in the Punjab there are years of freedom from cholera followed by epidemic years.

We fixed our lab. at Lahore in the Medical College. I have been working in the villages in the Lahore District while d'Herelle has been doing laboratory work. Lahore is the town where Kim met the holy man from Thibet; where the famous gun "Zam Zammah" lies just opposite the Indian Museum. The work has been very tiring; I have travelled about 80 miles by car every day, or almost every day, over some of the worst possible roads sometimes on foot or by pony or tonga (a springless horse cart), and have slept and eaten meals in cholera-infected villages and seen all kinds of queer sights: marriage parties, circumcision parties, wrestling matches, fairs which are essentially marriage markets where eligible women are bought and sold to eligible young men, the parents haggling over the price according to the virtues and beauty of their daughters. I have examined the chest and heart of a zenana woman through an opening in a curtain without catching a glimpse of the fair one's face, have seen the dry brown tongue through the self-same slit, examined the abdomen through layers of clothing and have inoculated many through their chemises or whatever corresponds to that garment amongst Mohammedans. I am never tired until I get home in the evening as there is always something amusing or interesting to do or to see during the day. I leave the hotel at 6.30 in the morning taking some sandwiches, biscuits and a portable ice box containing lots of ice, soda water, limes (lemons) and sugar. I visit the most recently infected villages that are approachable by road, collect specimens of stool and vomit, treat the sick, permanganate wells and inoculate all who are willing. We are always on the lookout for marriage parties. Everybody seems either to be married or to be getting married in this country. From the 15th of June to the 15th of July is the most popular month for marriages, especially amongst Hindus. In a village of a few hundred people there may be as many as 20 marriages in that month, and they are one of the speediest ways of spreading infection. The bridegroom's relatives and friends come to the bride's

village and spend a couple of days there making merry; then the bride's friends and relations go to the bridegroom's village and return the compliment. As the friends may come from villages several hundred miles away and even from other districts, and as there is no restriction on their movements even when they come from or go to infected villages you can easily see how they may spread cholera. Time and time again our records show that the first cases of cholera followed a marriage party. Not less astounding than the number of marriages is the number of babies. When crops are good every woman you meet is carrying a baby or is "to be about to be," as they say in the Latin grammers. The villages are awful dumps; a collection of mud huts built on a manure heap. Manure is of great value and is jealously guarded, each householder keeping his in or near his own backyard, for fear his neighbour should steal some. Flies galore, flying busily from stool to food! Wells, surface wells, all over the place, where they wash their clothes, bathe, gather together to gossip and collect water for drinking. We have found vibrios in the wells and bacteriophage in the wells, vibrios in the flies and bacteriophage in the flies. According to d'Herelle it is the bacteriophage in the environment that prevents whole villages from being wiped out, and I believe he is right.

* * * * *

I was not able to finish this letter as I received orders suddenly to return to Kasauli to take over the anti-rabic work at the Pasteur Institute. Colonel Cunningham who is in charge here is also General Organizing Secretary of the Congress of the Far Eastern Association of Tropical Medicine, which meets in Calcutta in December, and he is swamped with work so I have relieved him of the anti-rabic part of his duties.

This station is by far the largest of its kind in the world. We have at present undergoing treatment about 200 patients, *i.e.*, as many as some Pasteur Institutes treat in a year. Our total for last year was over 8,000; there is no institute that approaches this figure except the one at Budapest which is about 2,000 behind us. I am sending you a photo, giving an idea of the great crowd that turns up in the mornings for treatment. About 50 per cent are really bad bites and only 2 per cent are licks on cuts or abrasions. In Europe the percentage is almost the other way about. Some of the face bites we see here are truly appalling. All patients are treated free of charge, and those who are certified to be indigent are given free transportation and a daily maintenance allowance. I am sending Dr. Meakins the hippocampus of a rabid monkey showing Negri bodies from which he can have sections cut for the class.

The treatment of cholera with bacteriophage has been quite successful and if it is confirmed later it will be an important finding. I treated in the villages 69 cases with a death rate of 8 per cent; there were 77 controls treated with essential oil mixture or with other drugs with a death rate of 63 per cent. It is practically impossible to treat cases in villages with intravenous saline. Probably a combined treatment with intravenous saline plus bacteriophage would save all patients seen in the early stages of cholera.

R. H. MALONE.

Kasauli, Punjab, India,
September 30th, 1927.

THE CONDITION OF THE HOSPITALS IN CHINA

To the Editor:

As far as it has been possible, up to date, to gather information with regard to the present condition of the hospitals in China, it is presented below.

The data have been gathered for the most part through the office of the Secretary of the China Medical Association, who has given a great deal of time to keeping in touch with the hospitals as far as this has been possible. In many places where the hospital work has been taken over by Chinese members of the staffs these colleagues have been too busy to keep us in touch with the hospital, and some have not grasped the importance of keeping the office informed.

While over 80 per cent of the missionary staff in China were withdrawn during the spring and early summer of this year, some of these workers have already returned to their work and stations, and many of those returning have been the medical workers, so that the figures may not be absolutely correct in every case; however, they will give a good idea as to how medical work has been treated by the fighting factions in China.

The provinces where the Nationalist party, and especially that part of its army which was predominately "Red" or Communistic, suffered most from the depredations of the Nationalists and there most of the hospitals are closed. On the other hand, in the province of Szechwan, where the Nationalistic party was not so tainted with Communism, the hospitals were able to carry on wherever they had Chinese who were capable of doing the work. In only five of those reported, was it necessary to close down, on account of insufficient staff. One or two of these have since opened with supplemented staff, and more will open as the foreign missionaries return to the fields. This province has suffered the least of the eighteen provinces, and work has been carried on steadily. Had it not been for the pressure of the consular authorities, the missionaries would not have had to leave this province.

While the appended list is not complete, it covers over 75 per cent of the hospitalization

of China, and will give the reader some idea of the scarcity of hospitals in China with its population of four hundred million.

	No data	Taken over by Government	Looted or Destroyed	Closed	Temporary Arrangement	Running Normally	Number of Hospitals
HOSPITALS IN:							
Manchuria	..	..	..	..	..	14	18
Chili	..	..	1	1	4	14	20
Shanshi	..	..	..	1	5	4	10
Shenshi	..	..	1	..	1	..	2
Kansu	..	..	..	..	..	2	2
Shantung	1	..	..	..	7	11	19
Honan	..	..	..	12	1	..	13
Kwangtung	..	..	..	6	10	2	18
Canton and Swatow	..	1	..	1	..	6	8
Kwangshi	..	..	..	..	3	1	4
Kweichow	..	..	..	1	1	..	2
Szechwan	..	..	..	5	12	2	19
Yunan	..	..	..	..	..	5	5
Fukien	..	..	..	5	18	7	30
Hupeh	..	..	..	2	5	..	7
Hunan	..	..	..	..	..	1	..
Kiangsi	..	..	..	3	2	2	7
Chekiang	..	1	..	1	4	3	9
Kiangsu	..	1	1	9	7	1	20
Anhwei	..	1	..	4	3	1	9
Totals	1	4	3	51	83	62	222

Remarks.—Some not reporting.

WALLACE CRAWFORD

1049 Richmond St.,

London, Ont.

THE GENERAL PRACTITIONER

To the Editor:

I have just read in the October number of the *Journal*, the article by Professor J. D. Adamson of the University of Manitoba, on Specialization in Medicine. With much of what Professor Adamson says I am in agreement. "Specialization is imperative if the work is to be done thoroughly and if progress is to continue;" "Specialism, is inevitable and will increase." In this I suppose we all agree, but with what he says of the general practitioner I thoroughly disagree. He says, "the general practitioner is naturally going," and "even now there are no general practitioners."

I take the ground that of all branches of the medical profession the most important is general practice, and I hold that the chief business of the Medical Schools is to train general practitioners.

Professor Adamson says "the country practitioner himself is becoming a specialist, a specialist in obstetrics and acute illnesses." There is a great deal more in country practice than obstetrics and acute illnesses, and many a general practitioner is already a valued specialist in two fields. First, he is what the great majority of sick people need, and want. He is the Family Doctor, and, second, with this position for his clinic he is the "front line man" in contact with the enemy. It is he who sees the earliest symptoms of the diseases, injuries, and deformities which make our battlefield. There is a close parallelism between the combat of our profession with disease, and the services of the medical corps in war.

I think this address of Professor Adamson, with its brilliant backward glance at the evolution of Specialism, and its graphic survey of the present most unsatisfactory conditions and prospects of medical practice, is both timely and important, and I hope it may be followed by an active discussion in the *Journal*. Many great subjects have to be considered; among these are Medical Education, Public Health, Finance, and, not least, Human Nature.

JOHN STEWART.

Halifax, N.S.,

November 26, 1927.

Successful Claim for Fees.—"The moderation of most doctors with regard to fees always surprises me," observed Mr. Justice Roche recently during the hearing of a surgeon's claim in respect of professional services. The plaintiff, Mr. E. J. Deck, of 55 Welbeck Street, was suing Captain A. C. G. Smith, of the Royal Automobile Club, for £65, representing treatment over many months. Sir Alfred Fripp, a witness for the plaintiff, approved the treatment administered and stated that he considered the fees charged were very reasonable. It was at this point that the learned judge interposed the observation already quoted. The case contained no point of law. There was no question that the services had been rendered. Captain Smith, suffering from swellings in the neck, consulted Mr. Deck who administered treatment by ultra-violet rays. The defendant also attended a dentist who advised the extraction of his teeth, the dentist stating in court that his fees also remained unpaid. Eight months after his first consultation with Mr. Deck Captain Smith went to another surgeon and was operated upon. He took the view that his previous treatment had been wrong and, in answer to the plaintiff's claim for his fees, he set up the defence that the plaintiff had been negligent in the diagnosis and treatment of the case. The jury found for the plaintiff and judgment was given for Mr. Deck for the full sum claimed with costs on the High Court scale.—*Brit. M. J.*, Oct. 22, 1927.

Medico-Legal

MEDICAL MEN AND NARCOTICS: A WARNING

A recent case at Osgoode Hall indicated that the very stringent provisions of Canadian law as to giving narcotics to be used by the individual himself, may not be as well known in the profession as they should be.

A young doctor, just beginning the practice of his profession came under a suspicion that he was violating the law; an addict who failing to find a better way of making a living, offered his services to the detective department, and was employed to catch the doctor if he was transgressing. The spotter went to the doctor's office, said that he was an addict, that he had a severe abdominal pain, and asked for morphia to relieve it. The doctor made no examination but acceded to the man's request, went out and bought a considerable quantity of the drug and gave it to the patient. Then, the spotter said that he was always sick after he used morphia and that he could get relief only by taking cocaine; he asked the doctor to get him some cocaine, and the doctor did so, procuring for him a very considerable quantity. Information was laid, and the doctor was convicted before a police magistrate who showed all the leniency which the law permitted, and fined him $200.00. The doctor foolishly appealed to the Court of Appeal at Osgoode Hall and that Court upheld the conviction. Unfortunately for the doctor, however, the Court also found that the magistrate had no power to let the accused off with a fine, and that the law imperatively required a sentence of imprisonment. The Court however was lenient and sentenced the doctor to the shortest term allowed by the law, *i.e.*, three months in prison.

In view of the very serious consequences that may result from an infraction of the Statutes, a prominent member of the Law Society has been good enough to state precisely what the law is, and for this courtesy we thank him in the name of the medical profession generally.

Statutory Law of Canada as to Narcotics and as Affecting Medical Men

1. Differing from many offences in which the intent is the important matter, and an act is not a crime unless there is criminal intent—what lawyers call the *mens rea*—in the offence of furnishing narcotics, the law looks at the act alone, and no good intention helps the accused in the slightest degree—like the road to Hell, the road to the gaol may be paved with good intentions.

2. Ignorance of either law or fact or of both is no defence; ignorance of law does not excuse in any criminal case; and in this case, differing from some other cases, ignorance of fact does not excuse.

3. The physician must make sure of his facts before giving narcotics to anyone; belief however honest will not serve: there is always open to him the way of refusing, and the physician should consider that giving the drug is *prima facie* unlawful, and must be sure that the facts justify him before acting.

4. There is nothing to prevent a physician from prescribing or administering a narcotic as a medicine in the medical treatment of a patient who in the honest opinion of the physician requires it as a medicine.

5. A doctor may not prescribe, administer, give, sell or furnish the drug to anyone else.

6. In a case coming under No. 4. above the doctor may give the drug to the patient to take away with him and administer it to himself according to the directions of the doctor,—*unless* the patient is *a drug addict or habitual user* of drugs. If such a patient suffers from a diseased condition caused otherwise than by the excessive use of any drug, then and then only may the physician give him the narcotic drug for self-administration. But it must always be borne in mind that the physician does this at his own peril, as to the existing and actual fact, and that belief however honest will not suffice for a defence if the fact turns out different. It is always "better to be safe than sorry."

7. The statute has application to the following drugs, which we have been calling "narcotics", namely:—

Cocaine or any salts or compounds thereof.
Morphine or any salts or compounds thereof.
Heroin or any salts or compounds thereof.
Codeine or any salts or compounds thereof.
Opium or its preparations, or any opium alkaloids, or their derivatives, or salt or preparations of opium alkaloids or their derivatives.
Eucaine or any salts or compounds thereof.
Cannabis Indica (Indian hemp) or hasheesh, or its preparations or compounds or derivatives, or their preparation and compounds.

8. The punishment, according to the method of prosecution adopted by the Crown, is either a fine from $200.00 to $1,000.00 and costs; or imprisonment from three to eighteen months.

9. And the moral is "Don't do it."

Special Articles

A NOTE ON HEART STIMULANTS

By W. D. M. Lloyd, M.D., M.Sc., L.M.C.C.

Department of Pharmacology, University of Western Ontario Medical School London

Often in our practice we use drugs which have become popularly known as "heart stimulants." The term is familiar to laity and profession alike, yet, if we were to analyze the phrase, we would have difficulty in explaining its meaning. We would find, with Sir James Mackenzie, the word "stimulant" so poor a word for a scientific vocabulary, that we should wish to avoid it. It is much better to say simply that we hope such a drug may increase the force of the heart's contraction, may increase the output of each cardiac systole, or may accelerate or lessen the frequency of the heart-rate.

Over a year ago now, in the quest for a drug that might benefit a tiring heart, I tried the effects of the popular heart stimulants upon perfused hearts in the laboratory, and upon many hearts at the bed side. As a result, it was found that, for the very transitory period of four to five minutes' duration, epinephrine would increase both the frequency and the strength of ventricular systole. Calcium would increase the force of the cardiac systole and the ventricular tonus, but its use was dangerous because of the production of various cardiac arrhythmias. Caffeine excited the cerebrum, sometimes aroused the patient from coma, but in a race habituated to the use of this alkaloid, it exerted a very inconstant effect upon the circulation. Camphor and strychnine only increased the reflex irritability of the spinal cord. As regards the demonstration of any action which might be regarded as of a "heart stimulant" type, the results were unsatisfactory.

Moreover, the attitude of mind, the mood, let us say, which desired to flog to renewed effort a fatigued myocardium, did not seem a right and proper one. We could not help but feel with Clifford Allbutt that these hearts were not hearts which were "failing"—one fails only in the presence of equal and reasonable strain—but hearts which were being "fatigued," or "defeated." There is a touch of sentiment in these words of the great master who, loth to speak of the failure of old and tried friends, spoke of them in this fashion, a terminology mayhap more accurate. Even hearts which by a dose of epinephrin we were able to make beat more strongly and faster for a few moments were ones which already were putting forth their best efforts. If we flog such hearts at this critical moment they will tire the sooner, will be defeated the more quickly. Is it not a great biological principle that over-excitation is always followed by fatigue? The really important service we can render the tiring heart is to give it rest, rest in bed, aided by opiates if necessary; codeine and even morphine, unless contra-indicated by respiratory failure or Cheyne-Stokes breathing, are better "Heart stimulants" than caffeine, strychnine or camphor. Digitalis may be used because it acts upon the vagus, slowing the heart when diseased, increasing the period of diastole during which the heart muscle may rest. It is the rest which the heart obtains during diastole that makes it the more capable of bearing the load in systole, and if we can diminish this load by the orthopnœic position, by lessening the blood pressure, by the removal of work, worry and excitement, and, possibly, by administration of the nitrites, that much more is gained. We have all heard of the thoroughbred who "cracked" on the home-stretch because the rider used the whip.

Our real problem in treating cardiac cases lies in presenting to ourselves after many careful examinations of our patients these propositions: "Can I by judicious administration of medication in any way alter the pathological lesions existent in this heart? Am I able to change the sclerosis in the aorta, or in the coronary arteries? Can I change the fatty, hyaline, or amyloid degeneration in the heart muscle? Can I remove this embolus? Am I able to alter the fibroid patches, or remove the areas of coagulative necrosis in the myocardium?" In some cases, the heart, though possessing similar lesions, suffers embarrassment chiefly because of a functional issue; auricular fibrillation has supervened. In such cases if we have recourse to our one dependable cardiac drug we may find that a standardized preparation of digitalis in sufficient, and often large dosage will frequently, either by means of the vagus, or else through an action on the intrinsic genetic nervous system of the heart, interpose a block to a large number of the useless impulses arising from aberrant foci in the auricles and harassing an overworked ventricle. Such a medication greatly rests the heart, and allows passage only to those beats which are capable of propelling the column of blood to the periphery. It is with such specific indications that we are in a position to do real good with digitalis. To prescribe it for the already poisoned heart of pneumonia, influenza, diph-

theria, and thyreo-toxicosis, unless fibrillation be present, is to add another toxin to that of the disease, and is not only illogical and useless but harmful.

EPIDEMIC ENCEPHALITIS

By A. W. Young, M.D.

Montreal

Epidemic encephalitis, encephalitis lethargica, sleeping sickness, is a disease only recently recognized by the profession; but since its recognition it has persistently claimed the attention of the profession both in its acute and chronic phases. Elusive in regard to its etiological factor, and ever demanding the careful attention of all interested in the interpretation of its confusing symptoms, the disease has remained obscure and defiant to the best observers on both continents.

In Canada during the past few years since its outbreak, the acute phase of the disease has cropped up sporadically, often mild in degree, and very often undiagnosed, because of the absence of the symptoms which usually stamp it beyond all measure of doubt. Misled by the absence of the outstanding features, such as profound and prolonged stupor, protracted delirium, sleeplessness, excitement bordering on mania, diplopia, involuntary movements of an athetotic and choreiform character, the diagnosis is not infrequently overlooked. Seldom is the disease portrayed by any of the above severe symptoms; more often it is manifested in its acute phase by a mild tired feeling, exhaustion, diplopia, or the combination of some of these symptoms with the absence of fever.

Historical Survey

Prior to the outbreak of a few years ago three epidemics were described; Tübingen Schlafsucht, 1712-13; "Nona" in Italy, 1889-90; and Dubini's electric chorea, 1846. Various isolated cases have been reported by Gayet (1875), Jeliffe (1890), Nixa (1908), and Hall (1913). In 1916-17 the chief epidemic occurred with which we are so familiar. It appeared in Austria and France and along the British front. 1918 it appeared in England, and in the autumn of the same year it occurred in America. By 1919 it was generally distributed throughout the European countries and America. Boyd reported it in epidemic form in Winnipeg in 1919. A serious outbreak took place in Europe in 1920. In 1922-23 there was a distinct recrudesence and sporadic cases have been seen in all countries ever since.

Etiology

Both sexes are equally affected. It may occur in all walks of life. No age is exempt. All races are equally prone to it.

A great deal of work has been done in the search for the agent which produces epidemic encephalitis, but as yet no one has arrived at any satisfactory conclusion. In the experimental inoculation of rabbits with material from cases of epidemic encephalitis, lesions in the brain were produced similar to those found in the human. This was later discredited by McCartney, who found identical changes in 55 per cent of apparently normal rabbits. Others have found a close resemblance between the action of the virus of herpes febrilis and that of the active agent of epidemic encephalitis. Perdrau successfully inoculated rabbits by fortifying the virus contained in human brain-pulp and his observations led him to conclude that there are three types of encephalitic infection in the human subject, dependent on the degree of immunity set up; (a) a very mild form with a good immunity response; (b) a chronic or fatal one with a moderate response; and (c) a fatal course with no response. The virus from the fatal cases could be transmitted with ease to rabbits, whereas the virus from the other forms appeared to be less virulent.

Epidemic encephalitis differs from polio-encephalitis in that the former occurs during the colder months of the year—January, February, and March. No age period is exempt in encephalitis, whereas 80 per cent of cases of polio-encephalitis occur before the age of twenty. The toxins of encephalitis rarely attack the anterior horn cells of the spinal cord.

Boyd in 1919 reported fifty cases of epidemic hiccough, with and without fever, and noted the similarity between it and epidemic encephalitis. The two appeared more or less simultaneously in a community, and sometimes occurred in the same family and one appeared to develop from the other.

Influenza has often been confused with it, but it is now known that they are two different diseases. Several cases may occur in the same household, and in institutions. However some members of a family may escape. It appears to be only mildly contagious. A few instances have been reported of a mother transmitting the disease to her offspring, but as a rule this is not the case, and when it does occur, it is probably through the milk. The incubation period is given as a few days to three weeks, but all evidence in this respect is scanty.

Pathology

The striking feature of epidemic encephalitis is the absence of macroscopic changes in the brain. McKenzie even differentiates between epidemic encephalitis and encephalitis due to other causes such as influenza, toxæmia of pregnancy and polio-encephalitis, by the absence of macroscopic changes in the former, and the presence of hæmorrhagic exudates and

areas of softening in the latter group. Hall, however, has reported a few naked-eye changes in epidemic encephalitis, *i.e.*, congestion of the superficial vessels, a certain amount of opacity and thickening of the pia, occasional meningeal hæmorrhages, and other smaller subarachnoid hæmorrhages. The chronic form of epidemic encephalitis, producing symptoms of paralysis agitans, fails to reveal any macroscopic changes in the brain. The microscopic appearance of the acute phase of the disorder is characterized by diffuse lesions of a moderately acute inflammatory character in the brain, especially in the basal nuclei and the substantia nigra in the mid-brain. Occasional foci of infection can be seen scattered diffusely throughout the brain, independently of any areas, characterized by perivascular infiltration, neuronophagia, degeneration of the neurones, and proliferation of glial cells. An occasional hæmorrhage of small calibre can be seen very often. Greenfield noted an accumulation of lipoid in the nerve cells and around the blood vessels.

In the case of the Parkinsonian syndrome, the consensus of opinion is that the most pronounced lesion is to be found in the substantia nigra. The melanin-bearing cells of this region are degenerated and the melanin lies scattered diffusely in the neighbourhood. Cellular changes in the basal ganglia and the cortex have been noted.

There are a number of instances where the cerebro-spinal fluid is normal or nearly so, but usually in the first few weeks of the disease a lymphocytosis from 10 to 100, or even more, is seen. Polymorphonuclear cells may be present, but it is more common to find a predominance of lymphocytes. The protein element is often normal, even though there may be an increase of cells. Yellow hæmorrhagic fluids are sometimes found. The glucose content is usually high. The colloidal gold curve is that of a luetic type, sometimes even paretic.

Symptomatology

A well marked case of the disease begins as an acute febrile illness characterized by somnolence, retardation of the mental processes, a slowness of the reaction time, confusion, apathy, and at times an inversion of the sleep-rhythm, that is to say, wakefulness at night. Delirium may take the place of lethargy, and, if so, the patient may be very noisy, restless and excited, or the delirium may be very mild, with a predominance of hallucinations and delusions. Diplopia and headache are common. In not a few cases, however, the disease may be slow and insidious in its onset, and so mild as to remain undiagnosed, only to be recalled afterwards by the appearance of the Parkinsonian syndrome.

In 39 cases of post-encephalitic Parkinsonism the diagnosis of the earlier illness in 29 instances was encephalitis; in 5, influenza; in 2, rheumatic fever; in 1, appendicitis, and 1 had no previous illness. These mild forms of the disease, characterized by slight lethargy, fatigue, involuntary movements and transient diplopia even in the absence of fever should receive careful and diligent treatment.

Sequelæ

Parkinsonian Syndrome.—This is the most common after-effect of epidemic encephalitis. M. Levy reported 70 cases out of a possible 129. It may appear rapidly during the course of the illness, or there may be an interval of several years. The writer examined one patient in whom the Parkinsonian syndrome developed four years and four months after the original illness. The average interval in 39 cases was 7.2 months.

The clinical picture is characterized in the most marked cases, by an attitude of flexion of the whole body. The head is flexed on the shoulders, the shoulders are stooped, the arms are bent slightly at the elbow, the trunk bent forward, the fingers flexed, and the knees bent. The gait is slow and shuffling. The skin of the face looks greasy. The mouth is partly open and saliva dribbles from the corners. The eyes appear bright; the pupils are usually equal and they react much better to light than to accommodation; the convergence of the eyes is poor, weakness of the orbicularis oculi and blepharospasm are commonly seen. The speech is often monotonous and the voice is weak. The body appears to be stiff and rigid, and the movements of co-operation, such as arm swinging in walking, are defective. The hand-writing is often altered by the appearance of a fine tremor and a diminution in size.

Tremor is seen either at rest or on movement, the latter termed action tremor. In the majority of instances action tremor is much more pronounced than tremor at rest. Often the tremor is fine at rest, and becomes very coarse and irregular on voluntary movement. The rate and range vary from a very slow, wide-excursion tremor to a quick fine one. The tremor is chiefly confined to the hands, but the mouth and legs may be involved. It is increased under emotional stimulation and fatigue and tends to disappear during rest, and is absent during sleep.

Involuntary Movements.—Involuntary movements occur frequently after epidemic encephalitis, appearing either as the sole reminder of the disease, or accompanied by mental or other physical defects. They may occur occasionally during the course of the disease, or there may be an interval of several months or years. These movements may attract the physician's eye to the exclusion of all other ailments, but

on closer examination it is common to find a state of restlessness, quick fatigue, early exhaustion, insomnia, and sometimes physical defects of the pyramidal or extrapyramidal systems, and ocular defects. M. Levy classified the involuntary movements of epidemic encephalitis as follows: (1) choreiform movements; (2) bradykinesia; (3) myoclonic movements; (4) tremors. But, in addition, there are innumerable other unclassifiable involuntary movements, such as blinking of the eyes, spasmodic rhythmical movements of the tongue, and upward deviation of the eyes.

Respiratory Disorders. — Respiratory anomalies may occur during the acute stage, and also as "sequelæ." According to Turner and Critchley, they may be classified into three groups: (1) disorders of the respiratory rate, (2) disorders of the respiratory rhythm and (3) respiratory "tics". The respiratory rate may be greatly accelerated (tachypnœa), or depressed (bradypnœa). The rate may be increased from 60 to 100 per minute; sometimes it is so rapid and prolonged as to cause an over-ventilation of the lungs resulting in tetany. In bradypnœa the respiratory rate may be as low as 6 per minute. Disorders of the respiratory rhythm (dysrhythmia) comprise those in which there is an irregularity in the cycle of respiration, such as breath-holding (apnœa), sighing, cog-wheeled respiration, and bigeminal and trigeminal respiration. Respiratory tics, commonly found in children, are often mistaken for habits of a neurotic order, because they can be controlled for short periods; they are distinguishable on account of the accompaniment of other character changes. Hiccough, yawning, wide gaping of the mouth, and sniffling are grouped under this heading.

Spastic Paralysis and Muscular Atrophies.— Mild signs of pyramidal lesions indicative of paralysis, either monoplegic, hemiplegic, or diplegic in character, have been demonstrated as an after effect of epidemic encephalitis. In a few instances, the occurrence of it in the Parkinsonian syndrome has been remarked upon by Buzzard, Greenfield and others. The paralysis is sometimes complete, making its appearance during the acute phase. Muscular atrophies occur in the progress of the disease, as exemplified by Wimmer, and brief mention is made of a case by Riddoch. The latter are often associated with pyramidal or sensory disturbances which clearly point to a cord lesion.

Endocrine Disorders.—Pituitary and thyroid disturbances are occasionally seen after epidemic encephalitis. Sexual precocity, if it can be included under an endocrine dysharmony, is frequently met with in children. Parathyroid gland has been given to relieve the rigidity of the Parkinsonian syndrome with varying success.

Asthenia. — Following epidemic encephalitis there may appear symptoms very suggestive of myasthenia gravis or neurasthenia, because of the tremendous feeling of weakness, lack of concentration, worry, anxiety and sleeplessness. The state of fatigue, mild at first, gradually increases in degree, and becomes so overpowering that the patient is unable to conduct his business affairs or accept responsibility either within or without the home. During rest the fatigue remains unaltered, distinguishing it from the fatigue in myasthenia gravis, nor is there any part of the day when the patient feels brighter, as is so often the case in neurasthenia. Coincident with this asthenic state, physical signs may be found, such as ocular defects, mask-like facies, and involuntary movements, suggesting a Parkinsonian syndrome. This myasthenic picture has been stressed by Guillain and Alajouanine and Wimmer, who acknowledged a difference in the clinical course from the well-recognized myasthenia gravis. Riddoch maintains one should not use the term myasthenia in describing this clinical picture following epidemic encephalitis, because of the clinical distinctions and the pathological divergence.

Mental Disturbances.—The mental disturbances vary from a mild personality change to a persistent psychosis. Especially in children is the personality alteration very prominent. They show a psychomotor excitement, with or without nocturnal wakefulness and somnolence by day, extreme restlessness, irritability, mischievousness, aggressiveness, emotional instability, sexual precocity and delinquencies. They are usually destructive and ill-tempered. They may be bright, alert, and capable of understanding, but incapable of adhering to the demands made by other members of the family. They are unable to concentrate or give their attention to simple problems. They pass their time by cutting or tearing up articles of clothing, and when corrected they are apt to show their temper by throwing anything within their reach, or by displaying the common temper tantrum. The intellectual factor is seldom deranged. It is not long before the whole household is upset by their behaviour and institutional life is requested. Even in well organized institutions these children are most difficult to handle. The mental disturbances of a psychotic nature resemble the well recognized forms of either manic-depressive psychosis, schizophrenia or paranoia. Permanent dementia is uncommon. It is possible that any form of psychosis may develop, dependent on the mental attitude of the patient before the illness.

Prognosis

A mortality rate of from 20 to 30 per cent is estimated as the probable termination of the

acute phase. It has been considered by others to be as high as 60 per cent. On the whole, the course is uncertain, and so variable from day to day that a guarded prognosis should be given, even in the mildest cases.

Of the survivors, some will become perfectly well; others will be left with sequelæ which will remain stationary, improve, or get worse. For practical purposes it may be stated that 25 per cent succumb, 25 per cent recover completely, and 50 per cent develop sequelæ.

Treatment

During the acute phase complete rest in bed is essential. Nasal and pharyngeal antiseptic sprays and intestinal antiseptics should be administered. Polyvalent autogenous vaccine from the intestinal tract and naso-pharynx, and intrathecal injections of convalescent serum, if available, should be given. The results from the administration of arsenic have been commented favourably upon, when given by the intravenous or subcutaneous methods. Colin Russel has received encouraging results from the intramuscular injection of hæmostatic serum, giving one-half c.c., and an hour later, if no reaction is seen, two and a half c.c. This is repeated every second day for several injections.

The Parkinsonian patient claims to be benefited by taking atropine and hyoscine. Some authorities begin with a small dose of atropine, and increase it gradually until the patient has reached his maximum tolerance for the drug. Hyoscine hydrobromide, gr.: 1/150 by mouth is helpful. Parathyroid administration may be tried.

REGARDING ESSENTIAL HYPERTENSION

In a very interesting address* on this subject Dr. A. R. Elliott, of Chicago, has presented a clear statement of our present knowledge of this condition, which still remains one of the most puzzling and controversial problems of clinical medicine. Our recognition of the condition itself is of comparatively recent date, and the greater part of our knowledge has been gained since the introduction of the sphygmomanometer which dates back scarcely three decades. Richard Bright about the begining of the last century was one of the first investigators to draw attention to the existence of an enlarged heart and stiffened arteries in patients dying of nephritis. He attributed the condition to the presence in the blood and tissue fluids of some toxic material which the diseased kidneys failed to remove. This explanation was received as sufficient until, with the development of biochemistry investigators attempted to identify the special material that induced such widespread circulatory effects. One after another of the metabolites of the body were carefully investigated, but no one of them, nor any combination of them was successfully linked with the production of any persistent elevation of blood pressure. Research along this line however is still in active prosecution, and recent evidence would appear to point to the possible action of guanidine as an agent productive of a definite rise in blood pressure.

A few years later attention was drawn by Gull and Sutton to an alteration in the walls of the minuter vessels termed by them arterio-capillary fibrosis. This they assumed to be primary and to the peripheral obstruction caused by this condition they ascribed the central rise of pressure. George Johnson studying the same structural alterations reached the directly opposite conclusion that the high blood pressure was the cause rather than the result of this fibrosis. The point has not yet been decided as to which is the horse and which the cart in this matter. Careful studies of the minuter circulation appear to show that a true generalized arteriosclerosis does not exist in association with hypertension. Physiological experiments have also demonstrated that increased peripheral resistance in any special vascular area is promptly offset by vasodilatation elsewhere, so that the general blood pressure is not disturbed thereby. Vascular alterations appear to be almost always regional in character, and not invariable or even constant in their distribution. They involve most frequently the arterioles of the kidneys, and next in order of frequency the spleen, pancreas, and liver, but by no means any one of these organs constantly, but the great vascular areas of the muscular and cutaneous system have been found to be little if at all involved. Marked renal arteriosclerosis often exists without high blood pressure, and *per contra* high blood pressure without renal arteriosclerosis.

On the clinical side, the etiology of arterial hypertension has run the gamut of the fads. Since biochemical research failed to establish any significant connection between nitrogenous waste bodies and high blood pressure certain clinicians have darkly hinted that it is the result of intestinal auto-intoxication, whatever that term may imply. Hygienic disharmonies, nervous and emotional over-strain, and many other items have been duly examined, and while freely admitting that any one or all of these may aggravate the evil when once established, it has by no means been proved that they act as primary causes. Nevertheless, the rapidity with which deaths from diseases of the heart, blood

* Essential Hypertension, an address before the Buffalo Academy of Medicine, *Am. J. M. Sc.*, Aug., 1927, p. 244.

vessels and kidneys, which include those characterized chiefly by high blood pressure have advanced to the first place in our mortality statistics would appear to have some definite relation to our present day civilization, and be worthy of careful study.

Out of the maze of conflicting opinions on the primary cause of high blood pressure one thing stands out clearly. This is the influence of *heredity* as an important factor in its production. When we say this, we do not desire to imply that the condition itself is directly passed down to posterity, but we are convinced that a tendency may be inherited to early arterial changes of a senile character, or to some defective *anlage* which may under special forms of strain or toxæmia give rise to the condition of high blood pressure.

The relationship of overweight to high blood pressure must also be recognized. In an investigation of the records of the Life Extension Institute the only outstanding factor that distinguished the high blood pressure cases from the average was that of overweight. Some influence of focal infection was also evident. As to excess of meat, salt, sugar, etc., such excesses are not desirable from the standpoint of health and they may well be corrected in high blood pressure cases without expecting too much from such efforts. Such regulations of diet in the opinion of many do little more than lead to moderation in the total intake of food, a factor certainly of much importance.

The endocrine glands are regarded by most authorities as having little to do with this condition, but it has been noted that after the menopause women show a tendency to increased pressure, and that there are more elderly women than men have abnormally high blood pressure.

Dr. Elliott in his address stated that as the result of his observations he regarded primary hypertension as an expression of some morbid physiological tendency with a basis of familial predisposition, and that in its inception it is to be regarded as a vascular neurosis affecting certain individuals possessing abnormal susceptibilities, which pass into a state of vasomotor instability as middle life approaches. If we observe carefully a case of essential hypertension from an early stage we will find that the blood pressure is at first and for a considerable period moderate, and that it fluctuates within a comparatively wide range without any apparent reason. It is strikingly responsive to emotional and sensory stimuli. Tixier, quoted by Elliott, states that it is rare for blood pressue to remain stationary for any length of time. These casual fluctuations are not registered by any noticeable variations in the patient's subjective sensation, and are obscure in origin. An odd and interesting series of observations have been reported by Fischer (*Klin. Wochenschr.*, 1924, iii, 784). In a tabulation of 270 blood pressure readings in an unselected series of 80 patients, he found a difference between the two sides of the body. In only 13 per cent of the observations were the readings the same for the right and left arm. One must be chary in making deductions in a matter so obscure, but it would appear to be a fair inference that in the condition of high blood pressure there is considerable functional element operating through nervous pathways. A notable fact in connection with these cases is that the more malignant forms occur under the age of fifty. After fifty high blood pressure is apt to follow a comparatively mild course and may in some cases persist throughout normal life expectancy. This fact has been established both from clinical sources and from life insurance experience. The death rate at middle age among those showing high blood pressure is heavier than the death rate among similar types of people in later life.

As it would appear that every possible exciting cause had been carefully studied and found wanting, general principles must be chiefly relied upon in its treatment. All sources of focal infection, so far as may be possible should be got rid of. Sluggish bowels are not contributory to good health in any person, and constipation should be corrected.

If high blood pressure is to be regarded as a manifestation of a congenital fault or deficiency, rational measures of personal hygiene and a healthy environment may do much to protect the weak spots of a threatened constitution and give fair assurance of keeping the tension in his vessels within reasonable bounds. Any thoughtful observer who has had much to do with the treatment of primary high blood pressure will admit that it is only in the early stages of development that we can accomplish any noteworthy control of the condition. Only by a painstaking inquiry into the habits and environment of the patient, and a radical correction of disharmonies and eradication of harmful emotional and sensory stimuli that we can check the progress of the condition. Once the condition has become firmly established it pursues its life history with little alteration. Any control that can be exerted by the physician will be effected not so much by drugs as by such modifications of the patient's mode of life and personal hygiene as he will accept and carry out. Unfortunately during the early stage when treatment may be most effective there are few subjective symptoms; compensation is perfect and the patient regards himself as in satisfactory comfort and state of efficiency, and the results obtained will depend in great measure on the extent to which the patient is willing and economically able to co-

operate with his physician and follow his advice.

Hypertension is a malady that in its development affects the blood flow generally, and consequently the function of all the internal organs more or less. A pressure of 130 mm. or over on the diastolic side is one that neither heart or artery is able to tolerate for any length of time. Extravagant heights of systolic pressure are often borne tolerantly. The determining factor in prognosis is not necessarily the blood pressure record but the patient's tissue resistance, the ability of his heart and cerebral arteries to stand the strain. This all important factor is unfortunately not as determinable as is the blood pressure in mathematical terms. Clinical manifestations of functional decline announce to the attentive observer what may be expected, and the physician's usefulness is proportional to his ability to appreciate and interpret such indications. Every patient with persistent hypertension is a potential cardiopath.

Since the hypertension heart fails from fatigue, an effort should be made to postpone its development, and the physician should be keenly on the alert for evidence of progressive muscular deficiency. The patient may complain of a decline in the efficiency of his perceptive faculties, and lacks the normal healthy feeling of refreshment after the night's rest. More definite are the increase of dyspnœa and fatigue after moderate effort, the increase in the rapidity of the heart's action, and frequency of premature contractions. Other things being equal a change from the slow measured heart beat of high blood pressure to one persistently more rapid must be regarded as signifying the advent of myocardial insufficiency. Progressive elevation of the diastolic pressure must be watched with concern. The presence of gallop rhythm with œdema and nocturnal asthma need no emphasis. Cerebral developments are less easy to foretell. The urine should be analyzed at regular intervals and blood nitrogen examination made at least twice a year.

While it may be advisable to have the blood pressure taken periodically, it is certainly true that the less a high blood pressure patient thinks about the height of his blood pressure and the more he thinks of living rationally the better he will get along.

A VISIT TO THE LEPER ASYLUM, HEDALA, CEYLON

By Professor D. Fraser-Harris, M.D., D.Sc., B.Sc. (Lond.), F.R.S.E.

So few people now-a-days, with the exception of those who have lived in the tropics, have ever seen a case of leprosy, far less visited a leper hospital, that some account of my visit to the great asylum in Ceylon may prove interesting. By an exceedingly wise procedure, every case of leprosy diagnosed in Ceylon is removed to the asylum, so that through segregation the disease is kept within controllable limits.

The leper hospital, like all the other excellent institutions in this admirably administered island, is a government institution. The head of it is Dr. Pestonjle, a Parsee gentleman, who though he has been in charge here for twenty years is as keen on his work and as anxious to find a cure for leprosy as though he had just been appointed.

A friend of mine in the Public Works Department of Ceylon drove me out in his car through scenery very typical of the low-lying ground around Colombo. It was delightfully warm, for the mean annual temperature of Colombo is 82° F. The beautiful island looked very green with its huge cocoanut-palms and its rubber trees and gorgeous scarlet flowering shrubs, and with the swamps still pretty full of water from the recent rains, for June is in the "monsoon" season. The road, here and there blocked with bullock-carts, passed through villages where fowls, goats, and cattle live in the self same dust with the more human inhabitants. The chief industry in these collections of huts is stripping the fibre off the cocoanuts and crushing the oil out of the white substance inside.

On arrival at the main entrance of the asylum at Hedala, where a guard is posted, and where one may see the Royal Arms of Great Britain, we were received with true oriental courtesy by Dr. Pestonjle who, accompanied by an attendant, at once began the tour of the place. The grounds, which are surrounded by a high wall, cover many acres and include a Roman Catholic, an Anglican and a Presbyterian chapel.

The wards, as is usual in hospitals in the east, are in bungalow fashion, single storied buildings some of them, with roofs composed only of leaves and poles of bamboo. Some of these "wards" have indeed no sides or walls, the beds being literally in the open air. Each ward is a long rectangular building completely isolated from every other so that the open air cure is perforce part of the cure of leprosy in Ceylon.

Here and there we came upon nicely kept grass lawns, and in other places miniature gardens laid out by the patients to relieve the tedium of doing nothing.

We first visited a ward for women where we found the disease in every stage except the final.

Only an expert probably could diagnose leprosy in its earliest phase, where there is but a slight thickening of the cheeks and of the sides of the nose. It is a malady of essentially slow development, the infiltration of the skin proceeding gradually but steadily until the cheeks

and forehead are swollen and tuberculated, the nose enlarged, coarse, fissured and dog-like, the ears, and often the lips too, considerably thickened. The general appearance is highly unpleasant and infra-human, the description *facies leonina* being, if anything, too flattering.

While the primary infiltration of the skin is taking place, besides recurring attacks of fever there is hyperæsthesia, and an increase of the sweat; but a little later these regions of the skin become anæsthetic, the sweat is suppressed, and the hairs fall out. This last adds to the repulsive aspect of the sufferer.

The type in which nodules predominate is known as *Lepra tuberosa*.

In course of time the nodules ulcerate and some absorption takes place, so that the cartilages and the alæ of the nose disappear, a condition contributing still more to the revolting aspect of the unfortunate patient.

The specific cause of leprosy is known to be a bacillus (*B. leprœ*) discovered by Hansen in 1871.

The rate of infiltration is slow, so that the disease is characteristically chronic. A late site of the infiltration is the eye in which the cornea becomes opaque and the choroid, iris, and retina are destroyed, leading to all degrees of blindness. The sightless eyes still further increase the pathetic appearance of the leper.

There were 550 patients, men, women, and children, when I visited the asylum last June. They are carefully nursed by a devoted band of French-speaking Roman Catholic sisters and by Cingalese attendants.

The second type of leprosy is that in which the peripheral nerves are chiefly involved. There is therefore at first hyperæsthesia and neuralgia, followed by anæsthesia and atrophic changes in the skin and muscles, which latter become paretic.

This type is known as *Lepra maculo-anæsthetica*. The skin wastes and becomes very thin and glossy. Owing to paralysis of the facial muscles, the expression is lost (mask-like face) and the eyes cannot be closed.

The condition of the hand is very characteristic. Since the ulnar and the median are the nerves most usually affected, there is paralysis and wasting of the flexor muscles which leave the unopposed extensors to produce the familiar retraction of the hand. The paralyzed muscles including the interossei atrophy, so that a highly characteristic claw-like appearance is developed (*main-en-griffe*).

The atrophy of the fingers and toes leads to their absorption, even the bone disappearing or, as it is popularly called "falling off". Later the wrists and ankles are absorbed, leaving only shapeless stumps. Dr. Pestonjle showed me every stage of the disease from that in an infant-in-arms to that in a totally blind old man with no hands or feet who required constant nursing. One ward is reserved exclusively for these human derelicts in their final stage.

The extremely chronic and not very fatal nature of leprosy is shown by the fact that one man has been a patient here for 47 years, another for 50. Most lepers die from some intercurrent condition such as nephritis, tuberculosis or any low type of degeneration.

The mode of entry of *B. leprœ* is even now not a matter of certainty.

Dr. Pestonjle believes that leprosy is communicable by direct contagion, as from parent to child, for the child shows the initial lesions on the cheeks and buttocks which are exactly the parts to come in contact with the infected skin of the parent as he or she nurses the child.

Dr. Pestonjle is still searching for a cure, and he agrees that chaulmoogra oil, obtained from the seeds of a plant, *Gynocardia odorata*, is the only substance that can be called a remedy. This oil, about which so much has been written, will effect a cure in children if the disease be not of more than a few months' duration. The oil may be injected or rubbed into the skin, or given by the mouth, in doses beginning with ten drops three times a day, increasing to a maximum of two drachms. I was shown four children of about six years of age who had had injections of this oil for some months and were about to be discharged cured. In any other stage leprosy is incurable. A glycerine-diluted, filtered culture of the bacilli has been used as an injection, but not with encouraging results.

With regard to incidence, leprosy is commoner in the male sex, in whom it usually appears between fifteen and thirty years of age.

It has long ceased to be an endemic disease in Europe; the last case reported was one in the Shetland Islands in the year 1798. It had disappeared from England before the time of King Henry VIII. By the middle of the seventeenth century, leprosy had so declined in France that Louis XIV abolished the lazar-houses and devoted their revenues to the building of hospitals and to other charitable purposes. It is now confined to the tropics and sub-tropics of Asia, Africa, America, and the West Indies. It is still most severe in central Africa in a belt from Nigeria to Abyssinia, a region which in all probability was the original home of the scourge.

It is not easy for us to understand how leprosy has been so extremely dreaded in all lands and in all ages, seeing that leprosy as we know it to-day is not nearly so malignant as tuberculosis, syphilis, or cancer. But we may be reminded of the horror with which it was once regarded in the Old Country by visiting certain ancient churches which still possess in-

tact "the lepers' window". The lepers' window was a small, slit-like aperture in the wall of the chancel, and therefore behind the altar, through which the priest could hand the sacred elements to the lepers who were not allowed to enter the church.

In some cases another arrangement was made; the lepers sat together in a passage or narrow compartment so constructed with reference to the chancel that they could not be seen by the congregation but from which they could see the priest when he was officiating at the altar. The lepers while invisible to the congregation could yet receive the bread and the wine at the hands of the priest.

In the light of the most recent research, leprosy is to be classed as one of the "dirt" diseases, the infection of which is conveyed to man by the bite of the bed-bug, *Cimex lectularius*. The *B. lepræ* has indeed been found in a mosquito (*Culex pungens*), but the distribution of leprosy does not correspond with that of any known species of mosquito.

The reasons for incriminating cimex are briefly: The bacillus of leprosy has not only been found in bed-bugs, but it has been recovered from them sixteen days after they have fed on leprous patients.

Undoubtedly leprosy was banished from Europe through the combined effects of isolating the lepers and of the improved sanitary conditions which diminished the number of the bugs as well as the quantity of their infected food.

No other intermediate host would be compatible with the well known immunity of doctors, nurses, and other attendants in leper asylums.

The Indian Leprosy Commission of 1890 found that leprosy was a disease *sui generis*, and not a manifestation of syphilis or tuberculosis; that it was not hereditary, but both contagious and inoculable. They held that neither food nor climate originated it, but that each of these, amid insanitary surroundings, might predispose to the development of the disease.

In the course of our talk, I had time to ask Dr. Pestonjle whether he considered the leprosy of the Old Testament was the same disease which we call leprosy to-day. I especially recalled the expression used of Gehazi (II Kings V. v. 27)—"A leper as white as snow." He said he believed that leucoderma and certain parasitic skin diseases as well as the cutaneous manifestations of syphilis and even psoriasis, were all referred to as leprosy in the Bible.

Two long chapters (13 and 14) in the Book of Leviticus are entirely devoted to leprosy and the "law of the leper". In the light of our knowledge about leprosy the following points in the Biblical account are interesting:—

Ulceration followed on progressive inflammation; the hair turned white; segregation was recommended ("he shall dwell alone," Lev: 13, v. 46); leprosy was recognized in clothing which was to be burned, and in a house which was to be destroyed "stone by stone."

There is no doubt at all that if the segregation of lepers and the burning of all infected material had been systematically carried out, the disease would never have attained the proportions which we know it did attain.

We have probably no conception of the horror with which the leper was once regarded. He was provided with a special dress, a cowl, a stick and a pair of clappers, and was interdicted absolutely from appearing anywhere save in that garb. He was to cover the upper lip and cry, "Unclean, unclean!" he was never to walk on narrow paths, never to speak to anyone save when asked a question and then only in a whisper, lest his breath should spread the pestilence.

Medical science has rid us of many terrors, but of none perhaps more thoroughly than that of leprosy.

No account of leprosy would be complete without some reference to the marvellous life of self-sacrifice and heroism lived by Father Joseph Damien amongst the lepers on the Hawaiian island of Molokai. Here from 1873 to 1889 did this Christ-like man care single-handed for 700 lepers acting as physician, teacher, magistrate, priest, and grave-digger.

He finally himself succumbed to the disease.

Father Damien's practical Christianity was the thême of a fine essay by Robert Louis Stevenson.

Physicians' Evidence Against Their Brethren.—In a discussion at the Hunterian Society on the legal perils of the physician, a well known surgeon and the president of the Medical Defence Union, Sir Herbert Waterhouse, said he had been struck by the fact that one of the greatest legal perils of the physician was the treatment meted out to him in the witness box by members of his own profession. No matter how weak the case against a physician, he had never known lawyers on the other side to fail to find some physician to give evidence against his professional brother, and frequently those witnesses were leading members of the profession. And there was a tendency for certain well known names to appear in that capacity. This he considered to be a state of affairs discreditable to the profession.

Reports of Societies

REPORT OF MEETING OF THE OUTDOOR STAFF OF TORONTO GENERAL HOSPITAL

The meeting of the Outdoor Staff of the Toronto General Hospital took place on November 14th. Dr. Hutchison presented three cases for diagnosis, one of them, a case of massive painless œdema of the legs in a young girl, being of extreme interest. The history as given by Dr. Hutchison had little or nothing which bore on the present condition. Several months ago she noticed that her legs and thighs were getting very large, and that, on the left side particularly, the enlargement was enough to be called a deformity. There was no pain beyond a little aching at night, at which time the swelling was always a little more pronounced. The only detail which might have any bearing on the condition was a crop of boils over the buttocks, which had been present several months ago, at a time which preceded the development of the present great enlargement of the legs. Dr. Hutchison said his reason for presenting this case was that it seemed uncertain as to whether the swelling was due to blocking of the lymph-channels or the veins. He found it a very difficult matter to determine this point, and also how to relate a pilonidal sinus, with constant moisture oozing from it, to the condition of the legs.

Dr. A. G. McPhedran asked whether there was any history of preceding infection, such as typhoid, which might have caused a phlebitis, and whether there had been any fever. The possibility of an acute spreading lymphangitis might have to be considered as having preceded the present induration. He referred to a case of his own, recently under inspection, in which there had developed from an infected nail and corn a very extensive swelling and induration of the lower leg, not resembling the ordinary inflammatory œdema. He wondered whether in the case presented this evening the question of hypothyroidism should not be considered.

Dr. Shaver asked if it were not likely that one would see more discolouration than was present if the swelling were due to venous blocking.

Professor Graham pointed out that there was evidence of bilateral involvement, much more than had been at first suggested. The idea of blocking of the lymph-trunks seemed to him deserving of most consideration in the absence of the history of pain or infection.

Dr. George Young said it was difficult for him to dispose of the idea that a condition of this sort, so extensive and bilateral, was not associated with some obstruction in the main venous trunks, perhaps as high up as the vena cava inferior. Dr. Hutchison had pointed out the existence of a sacral dimple and one had to remember that such an evident developmental defect should always make one suspicious of defects elsewhere and that there might be some congenital defect in the veins. He referred, however, to the condition spoken of as Milroy's Hereditary Œdema of the Legs, and recognized the resemblance of this case to the pictures described by that writer. In further discussion, it was pointed out that a case, not unlike the one on exhibition, had been in the wards some years before, and had been seen by Dr. Libman of New York, who had suggested endocrine disturbance as being a possible cause of such cases. Reference was also made to a type of case which may sometimes be seen occurring as a result of infection in the skin, and one observer detailed a case in which bilateral brawny induration of both legs had seemed to follow a *fistula in ano*, with an impetiginous eruption on the buttocks; he also remarked that a group of such cases, with signs of inflammation and blocking of the lymph vessels and extensive œdema of the legs, had been observed in the Mayo Clinic by Sistrunk and reported in the *Minnesota Medical Journal* in 1923. These cases had been treated by the "Kondoleon" operation, an operation which promoted circulation by drainage through the fascia lata. The name non-specific elephantiasis had been applied to bilateral œdemas of this sort. Another group of six cases, very like the case on exhibition, had been reported by Gager in the *American Journal of the Medical Sciences*, August, 1923.

The second case presented by Dr. Hutchison was a healthy-looking Hebrew woman of thirty years, married, with no children, a devoted husband, and no worries. For a year she had complained of pain in the right upper abdominal quadrant, preventing all work. Examination of the pleuræ, spinal movements, abdominal reflexes, sensation, and urine were all negative. No abnormality of the bowel movements existed. On one occasion the sclera seemed slightly yellow. The van den Bergh was 0.9 units, indirect. Iodeikon, given by the mouth, did not enter the gall-bladder. She was admitted to the surgical ward with a diagnosis of cholecystitis, and a laparotomy was done in June. The gall-bladder was slightly thickened and had some slight adhesions, but was not removed, as the appendix seemed to be a more likely offender. For one month she was very well, then a recur-

rence of severe colicky seizures and a constant nagging pain in the right side appeared. Iodeikon was given intravenously and the gall-bladder showed a normal filling and emptying time. The patient was presented for suggestions as to management.

Dr. Conn suggested the possibility of there being an aberrant artery from the renal pelvis on the right side, which might be crossing the ureter and causing pain by interference with the urine flow.

Dr. H. A. W. Brown suggested the possibility of the pain being due to an intercostal neuralgia, and referred to an article by Dr. Carnett of Philadelphia, on the frequency with which this condition is confused with appendix and gall-bladder disease.

Dr. A. G. McPhedran, after examining the patient, thought that there was very evident trouble of the sacro-iliac joints on the right side, and suggested that roentgenological examination of the spine might throw some light on the subject if the pain were due to spondylitis.

Dr. Edward Jeffrey asked if the question of ureteral colic had been considered, and whether there had been any strangury, bladder irritation, or passage of blood.

Dr. Hutchison, in closing the discussion of this case, remarked that there had been many difficulties. In the first place the patient spoke no English, and it had been not clear as to just how this pain behaved. Naturally, the presence of a stone in the kidney and ureter had been considered and looked for, and it was the negative result of the various examinations which had allowed them to send the patient for cholecystectomy. It might well be thought that a general enteroptosis was the main affection present. He was grateful, however, for the suggestions concerning spondylitis, intercostal neuralgia, and ureteral obstruction. The so-called Hunner's stricture of the ureter, the stricture localized just below the pelvic brim, was something to be thought of.

The third case presented by Dr. Hutchison was that of a woman with sore mouth and tongue, and with a denuded patch on the right side of the base of the tongue. The patient was elderly, wore an upper and lower plate in her mouth, had a pronounced condition of arteriosclerosis, and a moderately elevated blood pressure. He suggested that the soreness of the tongue might be due to the plates themselves, and that the erosion was the result of a chronic infection because the blood supply to the tongue was impaired by the arteriocapillary fibrosis, much the same state of affairs as exists in the chronic ulcers of the skin in old people. It was suggested in the discussion which followed that the patient do without her teeth plates for a large part of the day, to see whether the chronic glossitis might be thereby relieved. It was pointed out that sore mouth and tongue is by no means an unusual result of wearing dentures, and that not so many years ago mercurial poisoning itself was seen as a result of absorption from the old fashioned plates.

Dr. Conn presented a case, which he said he could only bring forward with much diffidence, since, with the course of time, his diagnosis had had to be corrected. The case was that of a man who worked side by side with another of his cases, whom he had treated two years ago for pernicious anæmia, and since in the case he was reporting symptoms of weakness, sore tongue, dyspnœa and tingling of the toes had been associated with no gastric distress, a distinct yellow tinting of the skin and no loss of weight, he had at once thought of pernicious anæmia. The blood count had been suggestive, with 70 per cent Hgb., and 3,000,000 red cells, and a colour index of 1.1. There had been nothing in the physical examination and the blood smear which had looked suspicious, so he considered it very probable that pernicious anæmia was the condition to be considered. The patient was started on the liver diet, plus a good dose of dilute hydrochloric acid, and there was rapid improvement. In August, eight months from the first visit, he seemed to be gaining weight, his appetite was good and the hydrochloric acid was stopped. In October, however, the patient returned complaining of some distress in the abdomen, and Dr. Conn was surprised to find now a large freely movable mass in the left side. He was in doubt at the time as to whether this was a malignant disease of the colon, or a movable spleen. The mass was to the left of the mid-line, extending upwards to the splenic area; it was as large as a kidney, smooth, firm, easily movable, but did not behave in any way like spleen or kidney. However, in the absence of symptoms in the gastro-intestinal tract, and in the absence of any evidence of kidney disorder he was inclined to look on it as new growth of the colon, or as a wandering spleen. The barium series, however, showed a great filling defect in the greater curvature of the stomach with all the suggestions of malignant growth. The patient was now beginning to lose weight, and the diagnosis of carcinoma had to be made. The case was of great interest, as showing how some of these carcinomata of the intestinal tract may simulate the picture of pernicious anæmia. In the discussion which followed, Professor Graham suggested that we often overlook the very specific picture of the blood smear. This picture, with its macrocytosis, was often the most essential part in the diagnosis of pernicious anæmia. He suggested further that, as this case showed no secondaries and the patient was

still able to eat, the possibility of a resection of the stomach was before one.

Dr. Young presented a case of acute lead-poisoning, with severe colicky pain in the abdomen, radiating into the chest and back, and with burning sensations running down the legs. These symptoms had come on six days ago after a comparatively short spell of work on putty making and soldering. There was marked constipation, with loss of appetite; the patient showed decided pallor, and had evidently been suffering severely; the abdomen was scaphoid in shape, rigid and tender. The pain was wave-like, and, when at its worst, had been associated with numbness and whiteness of the index and middle finger. The blood had shown a moderate anæmia, secondary in character, with many stippled cells. By far the most interesting feature of the case, in Dr. Young's opinion, was the fact that the man was a nail-biter and showed finger-nails bitten down to the quick. We had departed somewhat from the idea that absorption from the intestinal tract was the common cause of lead-poisoning, and now favoured the idea that through the respiratory tract entered most of the lead, which eventually caused the trouble, but in this man it was only too apparent that from the habit of nail-biting must have come the present illness. It was not often, he said, that one had the etiology of these toxæmias so clearly in evidence. Dr. Young referred to the present day conception of lead poisoning, as detailed by the group of workers in the Harvard School, and called attention to the important changes which had taken place in the principles underlying the treatment of these cases. In this case the maintenance of a positive calcium balance in the blood had been secured by the administration of calcium lactate and milk. It was recognized, he said, that by keeping the calcium balance in the blood high, the lead in circulation would be deposited in the bones and placed where it could do no harm. It was the development of a condition of acidosis, which favoured the development of toxic symptoms. These acidotic states might take place as a result of many conditions, such as certain illnesses or improper methods of feeding. In this case, as in most, the colic was relieved as soon as the bowels had been made to move.

ONTARIO MEDICAL ASSOCIATION MEETING, KINGSTON,

May 29 to June 1, 1928.

Preparations are now under way for this meeting. Members of the Association are asked to note the dates and to keep them free. An attractive programme is in course of preparation. The following officials have been appointed, and committees and subcommittees are meeting weekly:

Chairman of Local General Committee, Dr. L. J. Austin; *Secretary,* Dr. W. A. Jones; *Chairmen of Subcommittees,—Arrangements,* Dr. L. J. Austin; *Commercial Exhibits,* Dr. R. J. Gardiner; *Scientific Programme,* Dr. W. T. Connell; *Entertainment,* Dr. Bruce Hopkins; *Ladies' Committee,* Dr. T. Gibson; *Motor Committee,* Dr. W. Gibson; *Publicity,* Dr. James Miller; *Registration,* Dr. F. J. O'Connor; *Housing,* Dr. R. R. MacGregor; *Badges and Placards,* Dr. M. J. Morrison; *Information,* Dr. G. H. Ettinger.

On December 6, 1927, the Fellows of the Academy of Medicine, Toronto, were addressed by Dr. Frank J. Lahey, formerly Professor of Clinical Surgery at Harvard University, Boston, on the subject of "Exophthalmic Goitre". The efficacy of surgical treatment, as opposed to other methods, was stressed by Doctor Lahey. An operation before the disease had progressed too far was a safe and sure remedy. Iodine, in his experience, had been of little avail. As a prophylactic agent to prevent goitre, as a method of preparing for an operation, and as a means of alleviating acute symptoms during a crisis, it may be of value, but it is not a cure. Dr. Lahey laid great stress on the value of accurately estimated basal metabolism in border-line cases. There was a very large attendance of medical men at the meeting.

MEDICAL SOCIETY OF NOVA SCOTIA, HALIFAX BRANCH

The Branch met at the Dalhousie Clinic on November 23rd to hear an address by Dr. Frank Mack on the "Importance of Symptoms in Urology." After referring to the disposition of many persons to delay consultation with a physician, Dr. Mack said that there are still many who seek medical relief at an early stage of their illness, and the thorough use of modern diagnostic procedures gives the physician opportunity to greatly reduce the proportion of inoperable growths, extensive tuberculosis of the urinary tract and badly damaged kidneys resulting from stricture of ureters, etc. Such complaints as pain, more or less definitely referred to the urinary tract, discomfort or difficulty in emptying the bladder, frequency of micturition, and changes noticed by the patient in the appearance of the urine should have careful attention. One should not be content to explain symptoms by changes found in the bladder, and thus run the risk of overlooking conditions higher up. Cystitis is not to be regarded very often as a primary clinical entity. Frequency of micturition is often the

earliest warning of urinary disease although it may be present in the absence of disease. The nature as well as the situation of pain should have careful consideration because of the assistance it gives in diagnosis. A complete history is also of great value. The urine should be carefully examined, and if there be pyuria or hæmaturia, a microscopic examination, always desirable, becomes imperative. The physical examination should be very thorough, and should include search for the explanation of the fever, chills, cachexias, etc., symptomatic of the toxæmias and sepses referable to the urinary tract. None of the aids to diagnosis now available to us should be neglected. Dr. Mack illustrated his address by extracts from a number of case histories, and by a fine series of slides of x-ray findings.

In the discussion, Dr. K. A. MacKenzie contrasted present urological methods with those of twenty years ago. Dr. Burris spoke of the value of catheterization of the ureter in cases of calculus, citing illustrative cases. He asked for information as to the frequency of ureteral stone. Dr. Johnston asked Dr. Mack's opinion respecting the frequency with which the tubercle bacillus appears in the urine in persons suffering from tuberculosis limited to the lungs. He had seen it stated in a journal article that it was to be found in 85 per cent of such cases. In reply, Dr. Mack would not venture to estimate the frequency of ureteral stone, but it is not very uncommon. In twelve out of a hundred successive autopsies the ureters had been found abnormal—either strictured or dilated. He doubted the reliability of the statement relative to tubercle bacilli in the urine.

CLEMENT MACLEOD

MEDICAL SOCIETY OF NOVA SCOTIA HALIFAX COUNTY BRANCH

At the meeting of December 7th, Dr. Howard M. Jamieson, who has lately returned to Canada to join the department of pathology, in Dalhousie University, gave an interesting account of the British Panel System. This system, which came into effect on the first day of 1913, aims at the provision of a general practitioner medical service for all persons who are of the working class, and also to ensure that they will receive something in the way of a money-benefit during such time as they are incapacitated for work by reason of illness or accident.

The whole scheme is under the direction of the Minister of Health, and is administered in each county or county borough by an Insurance Committee, made up of representatives of the insured patients, the medical profession, and the approved insurance societies—which provide for the money benefit, and such other additional benefits, in the way of specialist service, convalescent homes, etc., as the society may be in a position to provide.

From the doctor's point of view, the main advantage is the assurance that the income will be certain though small, but there are many disadvantages, such as interference by political interests, "red tape," annoyance and unreasonable demands on their time by patients who, no longer having to pay according to the amount of work required, have come to look upon the doctors as their employees, rather than people to whom they are looking for help. This attitude is rather fostered by the approved societies, who are inclined to advertise widely as to what additional things they have been able to enforce upon the doctors for the "benefit of their members," though in reality the benefit is chiefly to themselves, by way of additional members gained for their society through these extra services.

At first the profession was bitterly opposed to the scheme, but concessions have been made which have improved matters. It is recognized to be at least a shade better than the old "club system," previously in vogue, and the type of private practice for which payment is seldom received without a great deal of trouble. While the medical profession would be very glad to have a better system, it is likely that the panel system will remain until something better is brought forward.

The presence of vestigial remains in man and the lower animals at various stages of their existence has long been known. Many instances could be given, such as a caudal prolongation, branchial clefts, and a reptilian configuration of the roof of the mouth. All such cases are regarded by biologists as affording strong confirmatory evidence of the truth of the evolutionary theory. The latest discovery of the kind is that of Dr. Adolph Schultz of the Johns Hopkins Medical School, Baltimore. He has found a new and peculiar structure in man's body, to which he was guided in this way. Lemurs, which are the lowest of primates, have a little brush of bristles planted amongst the hair of the wrist, just above the palm; these little wrist-brushes are richly supplied by nerves and are sensitive to the lightest contact with leaf or twig. Monkeys and higher primates were supposed to be devoid of them, a fact which puzzled Dr. Schultz. In looking into the matter he found that the lowest of monkeys have still a vestige of the wrist-brush, and that a clear rudiment of it can be seen on the wrist of the human embryo —a rudiment which has but a brief and passing existence. A.G.N.

Association Notes

THE EXECUTIVE COMMITTEE

A meeting of the Executive Committee of the Canadian Medical Association was held in the Mount Royal Hotel, Montreal, on November 14, 1927, the following members being present:—

Dr. A. Primrose (Chairman); Dr. F. N. G. Starr, Toronto; Dr. S. R. Jenkins, Charlottetown; Dr. A. T. Bazin, Montreal; Dr. G. Stewart Cameron, Peterborough; Dr. J. G. FitzGerald, Toronto; Dr. Leon Gerin-Lajoie, Montreal; Dr. Geo. S. Young, Toronto, and Dr. T. C. Routley, Toronto.

Herewith follows a brief account of the business transacted which will be of general interest to our members.

Redemption of Bonds.—Dr. Bazin, the Honorary Treasurer reported that the outstanding amount of our bond issue has been reduced to $3,500. In all probability, this will be discharged during the coming year. The issue still has five years to run. To retire it four years before due date is a creditable showing, indeed.

Lister Fund.—The Honorary Treasurer reported this fund as complete, with a capital investment of $5,076.00. This amount remains in hand after paying the expenses of the Listerian Orator, Sir Charles Sherrington, who was with us at the Toronto meeting. Plans are already under way to secure an Orator for the year 1930. This presentation, by the way, will be at the joint meeting with the British Medical Association in Winnipeg.

Post-Graduate Work.—The Post-Graduate Committee offered the following from its report of the second year's work:—

	1927	*Compared with 1926*
Number of speakers	269	169
Number of addresses	729	513
Average attendance (per lecture)	27	29
Total attendance	19,683	17,264
Total cost	$28,831.66	$30,100.27
Cost per lecture per doctor	$ 1.46	$ 1.74

The Committee learned with much satisfaction that a third grant had been made us in the sum of $30,000.

Department of Hospital Service.—An announcement of great interest to our members and to the profession at large was presented to the Committee by the General Secretary, who reported that the Sun Life Assurance Company had made a further annual grant of $15,000 to the Association to provide for the establishment of a Department of Hospital Service, with a full time officer in charge. The Executive Committee hopes to inaugurate this department early in the New Year. Once again, we are deeply indebted to the Sun Life Assurance Company for this additional evidence of their confidence and for their wonderful generosity.

Royal College of Surgeons of England.—Dr. Primrose, Chairman of the Committee on the Royal College of Surgeons of England, reported that the outline of procedure in connection with the conduct of the first professional examination for the diploma of Fellow of the College had been carefully considered and amended, and was now ready to be presented to the Executive Committee for action. The Executive Committee approved of the suggestions which provide for the first examination to be held in Canada in 1929. Just as soon as the plan has been endorsed by the Royal College of Surgeons of England, full details will be announced through the medium of our *Journal*.

Royal College of Physicians and Surgeons of Canada.—On behalf of the proposed Charter Fellows, Dr. F. N. G. Starr, of Toronto, presented the plan outlined by the Committee in charge of the Royal College of Physicians and Surgeons for Canada. The Executive decided to ask the solicitor of the Association to take the necessary steps to ascertain what type of legislation should be sought to make the college a reality in Canada. The matter is now in the hands of the solicitor and an early report is expected.

Personal Archives.—An interesting report was presented by Dr. C. F. Wylde, Chairman of the Committee on Personal Archives, indicating that 1223 of our members had completed and returned to the Committee the Personal Archives Questionnaire sent to them. The Executive Committee hopes that those members who have not returned their forms will do so at an early date.

Periodic Health Examinations.—The Executive Committee was pleased to receive and approve from the Committee headed by Dr. Chas. F. Martin of Montreal, a manual and examination form to be used by the profession throughout Canada in connection with periodic health examinations. It is hoped that the manual and form will be printed at an early date, copies being available for all members of the Association.

Osler Memorial.—The Osler Memorial Committee outlined its plan of approach to the pro-

fession at large in connection with the canvass to raise $5,000 for an Osler Memorial Oration similar in type to the present Lister Oration.

The Annual Meeting.—Particular interest attached to the report of the Honorary Treasurer and General Secretary in regard to the securing of the Steamship *Northland* for a special two weeks' cruise to the annual convention in Charlottetown. This delightful trip so strongly appealed to our members that only a few reservations remain to be sold. Plans for the annual meeting are well under way both centrally and locally, and every indication points to it being a profitable and pleasant outing for all who avail themselves of the opportunity.

British Medical Association, Winnipeg, 1930. — Repeated requests having come from the British Medical Association for the General Secretary to meet the British Medical Association officials in England to discuss the proposed convention in Winnipeg in 1930, the Executive Committee authorized the General Secretary to proceed to England at some early convenient date, in order that plans may be promulgated, looking towards the meeting in 1930. The Executive Committee further approved of the suggestion that, if possible, a representative of the Winnipeg Committee accompany the General Secretary on the trip to England.

Committee on Nursing. — Dr. G. Stewart Cameron, Chairman of this Committee, reported progress in connection with the work being developed by the Committee representing both the Canadian Nurses and Canadian Medical Associations.

Mariners Committee.—A progress report was presented by Dr. C. W. Prowd of Vancouver, stating that the work of this Committee was under way.

Report of Committee on Intra-Canadian Relations.—Dr. J. S. Wright of Edmonton, reported that this Committee was endeavouring to work out in detail plans calculated to solidify organized medicine in every province throughout the Dominion.

Committee on Medical Survey of Canada.—Dr. Crane, Chairman of the Committee, requested that consideration be given to the advisability of employing a full time stenographic assistant for the purpose of carrying out the detail in connection with a complete medical survey of Canada.

Child Welfare.—Certain resolutions were presented by the Canadian Conference on Child Welfare, regarding the advisability of having compulsory registration of physical defects associated with the birth certificate signed by the profession.

Narcotic Drug Act.—The General Secretary was instructed to endeavour to secure from the Department of Health at Ottawa a memorandum dealing with the Narcotic Drug Act, to be sent to all members of the Association in order that they may be acquainted with the provisions of the Act.

Student Subscriptions.—The Executive Committee learned with interest that, up to the time of meeting, seventy-two new subscriptions to the *Journal* had been received from senior students in the various medical colleges of Canada.

Membership in the Association.—The Secretary reported that the total membership in the Canadian Medical Association for 1927 was 3,665. This is a gain of 622 over the year 1926.

Motor Emblems.—A suggestion coming from the Academy of Medicine, Toronto, in reference to the adoption of a new motor emblem embodying a green cross design, was passed to Dr. Geo. S. Young of Toronto, as Chairman of a committee, with power to add, to consider the matter and later report back to the Executive Committee.

Some of the other items dealt with by the Committee may be listed as follows:—

Discussion as to advisability of allowing a certain number of reprints to contributors to the *Journal.*

The advisability of allowing membership at large in the Association.

A discussion on the Campbell Meyers Bequest which provides for an annual prize to be awarded the reader of a paper on a neurological subject at either the national or provincial meetings.

Club rates for the *Journal.*—The Executive Committee approved of permitting a club rate of $5.00 per annum to non-medical subscribers.

Conclusion. — In reading the above report, members probably will be struck with the large amount and varied character of the business which your Executive Committee has to transact from time to time. The Association is a large, going concern with a great many ramifications, all of which, we trust, are of real interest to the medical profession in Canada. The Executive Committee desires to take this opportunity of thanking the many Committees of the Association for the loyal support and co-operation they are giving in conducting the work under their charge.

All of which is respectfully submitted.

T. C. ROUTLEY,

General Secretary

THE CANADIAN MEDICAL ASSOCIATION MEETING, 1928

At the Victoria Hotel, Charlottetown, P.E.I., November 9th, the local medical society entertained at dinner the following visiting medical men: Dr. F. N. G. Starr, President of the Canadian Medical Association, Dr. A. T. Bazin, Hon. Treasurer, and Dr. T. C. Routley, General Secretary; also Dr. S. L. Walker, Secretary of the Nova Scotia Medical Society, Dr. J. R. Nugent, Secretary of the New Brunswick Medical Society, and Dr. R. E. Wodehouse, Secretary of the Canadian Anti-Tuberculosis Association.

After dinner, Dr. S. R. Jenkins, President-elect of the Canadian Medical Association, briefly outlined the purpose of the meeting and called upon Dr. Routley, the main speaker of the evening. Dr. Routley, after thanking the local medical men for their hospitality, explained in a masterly way the immense amount of highly organized effort necessary to make the 1928 convention a success. The outstanding ability and tact with which the speaker went into the various details of this intricate organization deeply impressed everyone and clearly showed the reason for the brilliant success of these conventions in the past. Drs. Starr, Bazin, Wodehouse, Nugent and Walker followed with interesting and instructive remarks. The two latter medical men, who are members of our general committee, conveyed the good wishes and pledged the active support of our sister provinces, New Brunswick and Nova Scotia, where they are already working to insure the success of our convention. Members of our general and special committees took part in the discussion which followed. The appreciation of our local men was enthusiastically tendered to the visiting officials of the Canadian Medical Association and Drs. Nugent and Walker for their efficient and generous co-operation.

The meeting closed with a marked degree of optimism, which augurs well for the success of the P.E.I. convention.

ORGANIZATION FOR THE CONVENTION

Chairman of General Committee, Dr. W. J. P. McMillan, Charlottetown.

Secretary of General Committee, Dr. I. J. Yeo, Charlottetown.

General Committee, Drs. McMillan, Dewar, Warburton, Jenkins, J. A. McPhee, R. D. McLauchlan, I. J. Yeo, J. R. Nugent, St. John, S. L. Walker, Halifax.

Committee on Programme, Drs. Dewar, Warburton, McPhee.

Committee on Exhibits, Drs. Houston, Smith, R. Murchison, E. A. Foster.

Committee on Entertainment, Dr. Tidmarsh (Chairman), Drs. McGuigan, Tanton, Goodwill, Simpson, McKenzie.

Ladies' Committee, Mrs. S. R. Jenkins, and wives of the doctors.

Transportation Committee, Drs. H. D. Johnson, McKenzie, Smith.

Finance Committee, Drs. Warburton, Yeo, J. F. McNeill.

Registration Committee, Drs. Seaman, Ledwell, Sinclair.

Hotels and Housing Committee, Dr. J. S. Jenkins (Chairman), Drs. Archibald, Dewar, J. C. McDonald, W. J. P. McMillan.

Publicity Committee, Drs. McGuigan, McKenzie, Dewar.

THE VALUE OF EXTRA-MURAL POST-GRADUATE MEDICAL EDUCATION

The question is sometimes asked, "Is there any definite evidence of the value of the extra-mural work being conducted across Canada?" In our opinion, abundant evidence is before us of the value of the work, but we do not frequently see such tangible results as are depicted in the following letter:—

Dear Doctor Routley:—

I am glad to see by the November issue of the *Canadian Medical Association Journal* that the extra-mural lectures are to be continued for another year, thanks to the Sun Life.

I want to give you a concrete example of the value of these lectures to the general practitioner. During the past summer, I had the pleasure of hearing Doctor ——— of ———, while on his extra-mural lecture in the Maritimes. Among other things, he told us of a method of auto-transfusion of blood used in cases of ruptured ectopics where there is a large hæmorrhage into the peritoneal cavity—a procedure I had never heard of, and one so simple that it could be used without special equipment and without loss of time. A very short time after this, I was called in the night to see a woman. It was a case of ruptured ectopic. The woman was exsanguinated and the outlook was bad. Of course Doctor ———'s lecture immediately came to mind. We did the auto-transfusion with excellent results and the woman made a splendid recovery. I think it a fair statement that the woman owes her life to Doctor ———'s lecture.

———, M.D.

THE MEYERS MEMORIAL

In bequeathing the sum of $100.00 per year, for a period of twenty-five years, to the Canadian Medical Association—the bequest to be known as the Meyers Memorial—the late Dr. D. Campbell Meyers designates the nature of the memorial in the following, as extracted from his will, and further supplemented in a letter under date February 27, 1927.

"As I desire to perpetuate the study of the prevention of insanity in certain of its types, to which my life has been largely devoted, and as I believe the treatment of this phase of nervous disease belongs to the general physician and the

neurologist, I direct my Trustees to pay to the President of the Canadian Medical Association the annual sum of one hundred dollars for a period of twenty-five years only, to provide an honorarium to be known as The Meyers Memorial, to be awarded by a Committee consisting of the President, a physician and a neurologist, (the latter two to be chosen by the President), to such member or guest of the Canadian or Provincial Medical Associations as shall write and read at the annual meeting of any of the said Associations the best thesis or dissertation on the study and treatment of those functional neuroses which, if untreated, or not treated sufficiently early, might probably terminate in insanity, in the hope that the further study of those neuroses will lead to the formation of specially equipped wards in General Hospitals, devoted to their study and early treatment, and more especially in those hospitals where teaching to the medical student as well as the nurse is given, such theses to be submitted to and adjudged by the above Committee. Should no thesis of sufficient merit in the opinion of the Committee be read at the annual meeting of the Association the said grant shall not be made for that year by my Trustees. I desire that my good friend General John T. Fotherington, M.D., shall be appointed the first physician and Dr. George F. Boyer the first neurologist on the said Committee, and that they shall continue thereon as long as they desire to act."

FURTHER NOTES ON THE FUNCTIONAL NEUROSES AS MENTIONED IN MY WILL

"As the present nomenclature of both functional nervous and mental disease is more or less transitory and may change materially in the next few years, it is impossible to classify definitely the type of disease referred to above. I desire however, to refer to those functional neuroses in which the psychological symptoms form the essential part of the syndrome, and to that type of neurosis which develops in late adolescent or in adult life in a patient of previous good mental and nervous history, especially such neurosis as has its etiology in emotional overstrain caused by excessive grief, worry, and allied conditions to which modern life is so conducive, and which, when the present illness is successfully overcome, will enable the patient to at once return to his normal life as a good and useful citizen, and thus avert any of those persistent mental symptoms which so frequently remain as a result of a period of insanity.

"I desire to exclude from this thesis the study of mental defectives, paranoia, and similar conditions of mental disease due to hereditary or organic states, since the treatment of these conditions, however meritorious it may be from a humanitarian point of view, will not, I believe, remove the abnormal mental state of these individuals. Hence the best interests of the State will be obtained by the restoration to their normal health of those individuals, who previous to their illness were fully efficient as citizens."

Dated this 7th day of February, A.D., 1927.

(Signed) D. CAMPBELL MEYERS.

It is hoped by the Committee in charge of the Meyers Memorial that members of the profession interested, will co-operate through their Associations, by way of contributions to the programmes of their annual meetings.

Abstracts from Current Literature

MEDICINE

Bacteriæmia in Diphtheria. Martmer, E., *Am. J. Dis. Child.*, June, 1927, xxxiii, 6.

The general teaching is that diphtheria is always localized at the site of the lesion and does not invade the blood stream. Dr. Martmer points out, however, that when treatment is begun late in the infection, and in cases of marked severity, particularly when the organisms tend to multiply rapidly rather than produce a toxin of marked potency, also where there is a secondary invasion by other organisms, then there is a probability of encountering a systemic infection. This has not been recognized by the profession as generally as it should have been.

He quotes reports from several investigators. Deede and Roedelius, in particular, examined 313 cases and found Klebs-Loffler bacillus in the blood in three. The majority of this series were mild cases. Those with the bacteriæmia were of the severe type, two of them being of the hæmorrhagic type. Many other isolated instances are also given. The evidence obtained at autopsy examination of the blood is conflicting, but suggests that *B. diphtheriæ* has been found in the blood and in all the organs of fatal cases with more frequency than during life. The work of many investigators of this point is open to the criticism that they have not proved the virulence of their organisms by animal inoculation.

Dr. Martmer has repeated this work by making a series of blood cultures in forty cases of diphtheria. The blood was taken before the administration of antitoxin, and without regard to the severity of the condition. He used a 1 per cent glucose broth as the culture medium.

He found a blood-stream infection in six of this series. Three showed pure cultures of *B. diphtheriæ*, and the others a hæmolytic streptococcus. The chief interest in his findings is that the cases with the streptococcic septicæmia showed no hæmorrhages, whilst of the other three, two were true hæmorrhagic diphtheria, and the third case showed hæmorrhages from the nose and mouth before death. He concludes therefore that hæmorrhagic diphtheria is probably caused by a *B. diphtheriæ* bacteriæmia.

H. E. MACDERMOT

The Reality of Nerve Energy. Fraser-Harris, D., *Brit. J. M. Psychol.*, 1927, vii, 203.

This is a philosophical article based on a communication made by the author to the Section of Physiology of the British Association at the Oxford meeting in August, 1926.

The term "nerve-energy" is one that is widely employed, not only by the laity, but by physiologists, physicians, neurologists, and psychiatrists. For this reason the concept contained in it would appear to be a useful, even necessary, one. But, from the fact that many other expressions, such as, "nerve-force," "potential energy," "innervation currents," "nervous potential," "nervous tension," "neuro-rheuma," "neurine," are employed to designate the same thing, it is evident that the idea is somewhat nebulous. Hence the necessity for clearer thinking and more precise definition. The larger terms "vital energy" and biotic energy" are equally defective, and Fraser-Harris suggests "neuronic energy" as a non-committal term for nerve-energy. The author, also, points out the curious fact that while physiologists use the term "nerve energy," and apparently accept the reality of this form of energy, they never discuss it in their text-books.

Dr. Fraser-Harris deals shortly with what we know in regard to manifestations of energy in nerve fibres and nerve cells. He comes to the conclusion that nerve-energy and nerve-inhibition both must be real. He then gives Dr. Adrian's definition of nerve-energy, which is:—"The total potential energy in the neurone available for use in the transmission of impulses."

The author then passes on to the important matter of the measurement of neuronic energy. As he rightly says, the definition just given is of *potential* energy, and potential energy cannot be measured. It must first be converted into *kinetic* energy. Only the work done can be measured. He makes a number of suggestions as to how this may be done. The most obvious method is to estimate quantitatively the muscular work done by some form of ergograph. The result could be expressed as kilogramme-metres per unit-mass of muscle per unit of time.

This article is a helpful and praiseworthy effort to clarify a difficult subject.

A. G. NICHOLLS

Experimental Researches on the Nature of the Bacteriophage. Prausnitz, C., *The Lancet*, Sept. 10, 1927, 535.

In 1915, F. W. Twort made the fundamental observation (*Lancet*, 1915, ii, 1241), that in certain agar cultures of micrococci, some of the colonies became transparent and glassy and could not be transplanted. Microscopically, in such cases, no intact micro-organisms could be found. Filtrates made from such colonies were competent to prevent the growth of fresh micro-organisms of the same kind when inoculated with them. D'Herelle, in 1917, came upon the same, or a similar, phenomenon, in that the diluted and filtered stool of a dysenteric patient contained some lytic principle which could clear up cultures of Shiga's dysentery bacillus and cause its death. D'Herelle regarded this agent as a living microscopic organism of a parasitic nature, and called it *bacteriophagum intestinale*.

Much interest was aroused by these observations and very varying views were advanced to explain them. Some, like Kabeshima (*Comptes. rend. Soc. de Biol.*, 1920, lxxxiii, 1296), look upon the bacteriophage as a catalytic agent, acting by means of enzymes. Bordet and Ciuca regard it as a variant of the organism, by which autolytic ferment is regularly produced.

The studies of Weiss and Arnold (*J. of Infect. Dis.*, 1924, xxxiv, 317; xxxv, 505 and 603), have shown that bacteriophage acts antigenically as a ferment, and that antibacteriophage can be produced, which is of the same order as antitoxin and antiferments.

Prausnitz has attempted to carry the subject farther. He concludes that bacteriophage is about the sie of a molecule of collargol, *i.e.*, approximately 20 micro-microns, or 1/50th the diameter of *S. aureus*. He asks, "Is it possible to imagine particles only 20 micro-microns to be endowed with life?"

The author felt that neither manifestations of metabolism nor proliferation will help to settle this point. One must try to get proof of "random variability" ("mutation", incorrectly so-called) and of "variability in a definite direction," *i.e.*, adaptability to noxious influences. On the analogy of developing resistant strains of bacteria by accustoming them to grow in media containing increasing proportions of disinfectants, Prausnitz produced a strain of bacteriophage which was resistant to bichloride of mercury after nine passages, the original stock being readily destroyed in a 1-10,000 concentration of this substance. Similarly, he developed a strain resistant to carbolic acid and chloramine. His conclusion is that the facts "allow of no more plausible explanation than that the bacteriophage is a living organism."

A. G. NICHOLLS

The Falling Drop Method for Determining Specific Gravity. Barbour, H. G., and Hamilton, W. F., *J. Am. M. Ass.*, 1927, lxxxviii, 91.

This paper gives briefly a short and accurate method of determining the specific gravity of the blood. It consists in allowing a drop of the blood to be tested to fall through a column of a mixture of xylene and bromo-benzene, of certain proportion, as indicated in a table given. The length of time taken by the drop

of blood to fall is compared with the time taken by a drop of standard potassium sulphate solution; a correction is made for room temperature, and the result is added to the density of the standard solution of potassium sulphate. The reading is made quickly by means of an alignment scale. The full details can be found in a paper by the same authors in the *J. Biol. Chem.*, 1926, lxix, 625.

The method is simple, accurate to 0.0001 specific gravity, and can be carried out within one minute.

The authors mention some important clinical applications, which may be of use to medical men generally, as the technique is not difficult and the apparatus is cheap. The method can be employed to detect rapidly occurring oscillations in blood density, such as may arise in anæsthetic and operative shock. The administration of dextrose, acacia, or saline, and blood transfusion can be followed in the treatment, not only of shock but also of severe burns and heat-stroke. Other applications are the study of the hydræmic changes associated with insulin hypoglycæmia, and with the administration of thyroid extract and adrenin. Anæmias and œdemas can be more fully studied by the use of this method.

The authors point out the well-known, but not generally appreciated fact, that emotion will cause a recognizable anhydræmia. This factor may lead to considerable error in estimating results unless it is taken into account.

A. G. NICHOLLS

A Note on the Effect of Guanidine Hydrochloride upon the Epinephrine Output from the Suprarenal Gland and the Sugar Content of Blood in Dogs. Sugawara, Tadashi and Toda, Hyozo, *The Tohoku J. of Exper. Med.*, Sendai, Japan, Oct. 7, 1927, ix, 295.

Watanabe was the first to point out that the exhibition of a guanidine salt in rabbits was capable of producing hypoglycæmia. A subcutaneous injection of 0.15 to 0.25 of a gramme of guanidine hydrochloride led to an increase in the sugar content of the blood during a period of two to four hours subsequently, followed by a hypoglycæmia at the seventh hour, which persisted for several hours. These observations were confirmed by Bakuez. Quite recently Frank and his co-workers discovered that this action of guanidine was dependent on the richness of the glycogen deposit. Further, if the rabbits experimented upon were starved for twenty-four hours the initial period of hyperglycæmia was cut out.

The present authors supplement these observations by studies which are entirely confirmatory, and, in addition, show that their exhibition of guanidine hydrochloride intravenously in dogs in dose of 0.18 to 0.3 grm. per kilo of body weight accelerated the output of epinephrine from the suprarenal glands five to ten fold.

A. G. NICHOLLS

SURGERY

The Value of Lipiodol in the Diagnosis and Treatment of Abscess of the Lung. Ballon, Harry C., *Surg., Gynæc. & Obst.*, Jan., 1927, pp. 1-10.

Studies were made of ninety-four cases of abscess of the lung found in the records of the surgical services of the Royal Victoria Hospital, Montreal, during the past sixteen years. Fifty patients were between the ages of 20 and 40.

Twenty-five per cent of the abscesses occurred in patients who had operations about the mouth and throat. The roentgenogram findings varied. The ordinary x-ray gave, in a great many instances, an ill-defined anatomical localization of the site of disease and sometimes a false impression of the extent of the disease.

The bronchoscopic examination and lipiodol injection, carried out in fifteen cases by David H. Ballon, gave a more complete definition of the surrounding parenchyma and bronchial architecture, particularly of the left chest behind the heart shadow, and of the lung area below the dome of the diaphragm. It also demonstrated before operation the area of healthy tissue, both on the affected and non-affected side, and the presence of stenosis and carcinoma.

Lipiodol is a valuable aid, not only in diagnosis, but also in estimating the effect of treatment during the course of that treatment, and finally in estimating the ultimate results. No reactions from the use of this agent in this form of lung suppuration have been noted.

The author offers a classification of abscesses of the lung, based on studies after the injection of lipiodol. He subdivides them into four main groups, with subdivisions: (1) solitary; (2) multiple; 3 secondary; 4 tuberculous.

The result of treatment of abscesses of the lung by the different methods are recorded. Of seventy cases treated by rib resection, twelve were cured, thirty-one improved, four not improved, and twenty-three died. Eight patients were treated by rib-section and cauterization, the electrocoagulation needle being employed in four; three of the latter were cured. The electrocoagulation needle is a definite aid, in that it can be employed at frequent intervals, requires no preparation on the part of the patient, and produces no untoward reaction.

Of a total of eighty-eight cases treated, twenty-one were cured, thirty-seven improved, four not improved, and twenty-six died.

Mesenteric Lymphadenitis Simulating an Acute Abdominal Condition. Bell, Leo P., *Surg., Gynæc. & Obst.*, October, 1927.

Tuberculosis of the mesenteric lymph nodes was recognized in the early part of the nineteenth century by German and French writers. In 1895, Maurice Richardson of Boston first successfully removed tuberculous ileocæcal glands at operation. Most authors agree that retroperitoneal tuberculosis and lymphadenopathies of questionable tuberculous origin are diseases of early childhood and young adult life. The autopsy statistics on persons who had suffered from pulmonary tuberculosis show from 50 to 68 per cent occurrence of retroperitoneal tuberculosis and glandular involvement.

Braithwaite has definitely traced infected milk as a causative factor, but, on the other hand, the condition is known to occur in persons who have not partaken of milk. The factors causing the ileocæcal region to be the common site of entry of micro-organisms of tuberculous or non-tuberculous origin are: stasis, distension of the bowel, catarrhal inflammation, mucous abrasions, and lowered resistance of the surface epithelium caused by bacterial toxins. Some authorities favour entry through the Peyer's patches, regarding these as analogous with tonsillar tissue.

The order of invasion is: first, ileocæcal glands; second, those at the root of the mesentery; third, those of the ascending colon; and fourth, those of the sigmoid.

Pathologically the condition may be divided into: (1) simple mesenteric lymphadenitis; (2) suppurative mesenteric lymphadenitis; (3) tuberculous lymphadenitis; and (4) the terminal stage of mesenteric lymphadenitis.

It is difficult to establish a definite clinical picture, but the disease may be either acute, or chronic with acute exacerbations. The acute form has associated with it sudden onset with tenderness and rigidity more pronounced over the right lower quadrant. There is vomiting, with the temperature ranging from 100 to 103 degrees F., while the white cell count may be from 12,000 to 15,000. In less acute cases the tenderness is more moderate. The pain is usually of the paroxysmal type and severe enough to cause the patient to double up. It lasts about five minutes, recurs two to five times daily and stops suddenly. Carson believes that the pain is caused by a reflex spasm of colic incited by irritation of the vagus. In the chronic forms the symptoms are similar, the pain being colicky and recurrent, or of a drawing and dragging type. Acute exacerbations resemble that of the acute form.

In addition to the local symptoms, a number of patients present signs of tuberculosis elsewhere, while different authors have reported palpable masses in the right lower quadrant with a daily rise of temperature in the afternoon. Secondary complications are those of ileus; caseation, abscess formation; and miliary tuberculosis. The differential diagnosis, in children, is between appendicitis, pyelonephritis, Meckel's diverticulitis, and intussusception; while, in adults, intestinal and peritoneal tuberculosis must be considered in addition.

The treatment is medical and surgical. Medical treatment consists in a high caloric diet, rest, and out of door life and, in addition, quartz mercury lights and sunlight. Opening the abdomen apparently has a beneficial effect, because the patients promptly regain health. Abscessed and caseous glands should be incised, curetted, and their walls enfolded. The use of tuberculin is of little value. R. V. B. SHIEB

Dead (Preserved) Fascia for Hernia Repair. Koontz, A. R., *J. Am. M. Ass.*, Oct. 8, 1927, lxxxix, 1230.

Koontz reports the application to human beings of certain principles established in animals. Nageotte in 1927 transplanted alcohol-preserved pieces of tendons to repair tendon defects in living animals. He found that these "took", and his microscopic studies showed the details of the process. His theory was that the fibres of the connective tissues are "inert coagula, formed from living cells," hence preservation in alcohol does not alter their physical or chemical characters, as they are just as "dead" in the original animal as in the alcohol. The connective tissues act as a sort of framework when transplanted. The cells of the original animal contained in this framework are absorbed and cells grow in from the new host to form tissues in the old framework.

Christophe, in 1923, reported the grafting of an entire patella, with its patellar and quadriceps tendons, after preservation for three days in 80 per cent alcohol. The functional result was excellent and x-ray examination showed a normal knee four years later.

Koontz used alcohol-preserved fascial grafts from cats, dogs, pigs, and oxen to repair experimental hernias in dogs and cats. He found that these grafts acted very much the same as the tendon in Nageotte's experiments. Fascia lata from the ox was found to be most satisfactory. Hs now reports the use of similar alcohol-preserved fascia lata in operations on seventeen cases of hernia in human beings. The technique advocated by Gallie and LeMesurier for their "living sutures" was used. The hernias were of the following varieties: nine indirect inguinal (uncomplicated); two recurrent inguinal hernias; one strangulated indirect inguinal; one recurrent strangulated inguinal;

one ventral hernia, and one post-operative hernia. Six are now well after thirteen months. Only one recurrence is noted and that in a ventral hernia when complete closure was impossible. Infection occurred in two cases, due to bacterial spores not killed by the alcohol.

L. H. McKim

The Secondary Symptoms of Exophthalmic Goitre. Hinton, J. W., *Ann. Surg.*, October, 1927.

The cardinal symptoms of exophthalmic goitre in their chronological order are: tachycardia, tremor, enlargement of the thyroid, exophthalmos. However, the secondary symptoms are of much more importance in making a diagnosis during the early stages of the disease than these cardinal symptoms.

(1) Restlessness is frequently one of the early symptoms, it being difficult for the patient to remain still during a conversation. The patient is usually unaware of this condition, but it is noticed by members of the family or friends. (2) Irritability.—A patient with a very even temper may suddenly become difficult to live with and constantly quarrels on the slightest provocation. (3) Emotional instability indicated by a tendency to laugh or cry from the slightest cause. (4) Vaso-motor disturbances, in which there is a definite alteration of heat-tolerance. The patient is able to stand much more cold than previously, his skin being moist and flushed. This condition is more marked following slight exertion or excitement. (5) Palpitation.—This is entirely different from tachycardia and usually follows the slightest exertion. It does not bear any relation to the severity of the disease. (6) Appetite.—There is usually a definite increase in appetite, but, in spite of this the patient steadily loses weight. The author has only seen two cases in which there was a definite gain in weight. (7) Menstrual.—The first symptom may be a diminution at the time of the normal period. As the disease progresses, the time between the periods lengthens and, in the final stages, the patient may have complete amenorrhœa. (8) Sexual.—This is more often seen in males and is frequently a source of worry. The condition is relieved when the hyperthyroidism is cured. (9) Insomnia.—Palpitation seems to be a factor in insomnia. (10) Muscle fatigue.—The patient is constantly tired and complains that rest does not relieve the exhaustion and also complains of a sudden giving away of the knees when standing. (11) Hyperhidrosis, in which the patient complains of perspiring freely, particularly the hands and the feet. (12) Pains, occurring in the extremities, joints and back. (13) Hoarseness.—The author believes that this is quite frequently due to a sedative action of the thyroid secretion on the laryngeal nerves, producing a neuritis. (14) Falling of the hair, affecting small areas of the scalp. (15) Pigmentation of the skin, which, when it occurs, is confined to the exposed portions of the body, chiefly the face, neck and arms, and is usually localized in patches.

R. V. B. Shier

PÆDIATRICS

Ureteral Stricture and Chronic Pyelitis in Children. Hunner, G. L., *Am. J. Dis. Child.*, October, 1927, xxxiv, 603.

Imperfect drainage is usually the basic cause of chronic pyelitis in the adult. By far the most common cause of renal urinary stasis in adults is ureteral stricture. Hunner states that in most of the infants and children he has treated for chronic pyelitis, ureteral obstruction has been present, and the usual tests have led him to interpret the obstruction as due to ureteral stricture. Establishment of urinary drainage by dilatation of the stricture has resulted in a high percentage of cures. He suggests that most of the chronic infections of the upper urinary tract are located in the renal pelvis, and may be classed as pyelitis or infected hydronephrosis. The strictures, which may be bilateral, are probably due to chronic or recurrent attacks of inflammation in the ureteral wall, due to some distant focus, such as the tonsils, and are probably not congenital in origin. The age at which pyelitis occurs is no criterion as to the duration of the stricture, and does not help to determine whether the stricture is congenital or acquired.

Symptoms referable to the gastro-intestinal tract are among the most frequent concomitants of urinary stasis, whether the urine is infected or sterile. The urine is normal, or approximately so, in 80 per cent of patients suffering from urinary stasis. Hence the author suggests it is not wise to defer the urological examination until infection and pyuria supervene.

Case reports of twelve patients, all older female children, are included in the report, all of whom were relieved of their symptoms by dilatation of the ureteral strictures.

R. R. Struthers

OTO-LARYNGOLOGY

Endocrine Hypofunction in Ear Disease. Drury, Dana W., *J. Laryng. & Otol.*, June, 1927.

In this paper the author comments on the interest taken by the medical profession in endocrine hypofunction during recent years. He regards hypofunctional states as of common occurrence in general practice, and thinks that slight symptoms are very often of great value in diagnosing endocrine deficiencies.

After describing some of the general symptoms of hypofunction he cites a number of cases which showed ear symptoms; these were:—

(a) Two cases presenting tinnitus, vertigo, and a sense of fatigue; (b) a case presenting repeated colds, re-infections, and definite neuralgias; (c) a case presenting intermittent deafness, arthritis, psychic changes, and neurasthenia; (d) a case presenting eczema of the auditory canals, intermittent deafness, and vasomotor disturbances.

All these patients were found to have a lowered basal metabolism, slow pulse, and subnormal temperature. Thyroid medication improved all, and in one patient improved the hearing of high tones, where the patient showed some nerve deafness.

The special changes which he noted in these patients were as follows: Swelling of the mucous membranes; these became whitish in colour. The swelling frequently involved the larynx, causing alteration of the voice; the nose, making breathing difficult; and the Eustachian tube, causing tinnitus and deafness. Hallucinations of hearing were occasionally encountered. The author considers these were due to loss of vascular tone and imperfect circulation. A few of his patients had vertigo and loss of equilibrium on slight provocation.

He emphasized the fact that nasal and throat operations would not benefit these patients, and also that glandular malfunction must be demonstrated before medication be initiated. Where hypofunction has been found, treatment must be continuously administered in order to prevent the reappearance of symptoms.

G. E. HODGE

Malignancy of the Larynx and Œsophagus Treated by Radium Emanation. Herriman, F. R., *Laryngoscope*, Sept., 1927, xxxvii, 664.

In patients suffering from malignant growths of the larynx or œsophagus adequate exposure of the growth is given by the direct laryngoscope or the standard œsophagoscope, and the screened removable platinum radon seeds, designed by Joseph Muir, are implanted at regularly spaced intervals over the entire area of the growth. Improvement is reported in the case of eight "hopeless" patients. The author believes that this method of using radium should be tried, if only temporary relief is obtained.

W. J. MCNALLY

Radium Implantation in Œsophageal Cancer. Muir, J., *Laryngoscope*, Sept., 1927, xxxvii, 660.

The author has designed a special œsophagoscope for the introduction of radium in cases suffering from cancer of the œsophagus. This instrument, it is claimed allows of more accurate mapping out of the growth, and of more careful insertion of the radium. The radioactive centre employed is a removable platinum radon seed, which is so screened that it will not induce necrosis, and can be removed by means of an attached thread when it is no longer active. The procedure is facilitated if done under the fluoroscope. The series of cases treated by this method is so small, and the time since the treatment was carried out so short that no definite conclusions can be drawn; so far the results are highly gratifying.

W. J. MCNALLY

Obituaries

Dr. Henri Albert Blagdon of Verdun, died suddenly in his garage on November 18th. Dr. Blagdon had been cranking his automobile and it is thought that death was due to syncope. Dr. Blagdon was born in Montreal 40 years ago and always lived here. He had practised for several years in Verdun, where he resided.

Dr. J. H. Chartier, well-known physician in Montreal died December 5th at the age of 63 years. He had practised medicine and instructed students for more than 30 years and was in his student days associated with Dr. S. Boucher, City Health Officer and Dr. L. E. Fortier of the University of Montreal. He graduated in 1888 and went to Paris for post-graduate work. He was a professor at the University of Montreal and was president of the Society of Physicians and Surgeons of Quebec from 1900 to 1906. He was also a Governor of Notre Dame Hospital.

Dr. W. L. Gray died in Pembroke on November 6th. He had been a resident of Pembroke more than 45 years and was one of the best known practitioners in the Ottawa Valley. Dr. Gray graduated in Medicine from McGill in 1881 and took post-graduate work in Vienna before coming to Pembroke.

Dr. F. C. Hood, well known in Toronto, died on November 15th, after a long illness. Dr. Hood was a graduate of Trinity Medical College in 1885 and had long been known as an active member of the Academy of Medicine and of other medical organizations in Toronto.

Dr. Frank MacDowell Judson died in Brockville on November 13th. Aged 34, a graduate of Toronto in 1923 he had been an interne in the Toronto General Hospital and had taken over his father's practice at Lyn.

News Items

GREAT BRITAIN

A case has recently been tried before the Lord Chief Justice and a special jury which will be of interest, inasmuch as it has to do with an accident of easy and not infrequent occurrence, and one that has occasionally been dealt with in the courts of Canada.

A patient took action against a surgeon for damages for personal injuries, which she alleged she suffered by burning with a hot-water bottle, owing to the defendant's negligence during an operation. The defendant admitted the injury, but denied negligence, and counterclaimed his fee of fifteen guineas.

The operation was a sigmoidoscopic examination under an anæsthetic. The surgeon stated that he would require a nurse, and the patient asked him to choose one. A nurse was selected and made known her requirements, which included hot-water bottles. When the patient came out of the anæsthetic she was suffering much pain in the right knee, which was bandaged.

The argument for the prosecution was that there had been carelessness, for which the operator was responsible, because the surgeon was liable for the negligence of a person who was assisting him at an operation and was under his control.

The evidence went to show that the patient had desired to hold a hot-water bag during the operation. This she was permitted to do. The nurse in question had intended to remove it so soon as the patient was under the anæsthetic but had forgotten to do so. The bag slipped out of place and reached the patient's knee. The bag was covered. The doctors conducting the examination did not know of the presence of the bag. The burn was of the third degree. The nurse dressed the burn subsequently twice daily, and treated it at her own expense. One of the surgeons called for the defence deposed that persons conducting and assisting at an operation constitute a team, each member of which is trained in his own duties. As a rule, a surgeon did not interfere to see whether the other members of the team had carried out their particular duties. The preparation of a patient for operation was left to the nurse, including the task of seeing that hot-water bottles were not a source of danger to patient. He did not consider it the surgeon's duty in such a case as the one under review to ask the nurse if there was a hot-water bottle beside the patient.

The Lord Chief Justice said he was satisfied that there was no evidence to go to the jury. He did not deal with the question of negligence on the part of the nurse, though he thought that what happened might well have been a mere accident. But, in any case, he was satisfied that the surgeon was not responsible, if negligence there were. The nurse was to be paid by the patient, and in no sense was she the servant or agent of the surgeon defendant. It was a far-fetched suggestion that the surgeon in such a case should have exercised a superintending eye and satisfied himself that there was no hot-water bottle in a position likely to cause damage to the patient.

Judgment was entered for the defendant on the claim and the counterclaim with costs.

William Gibson Research Scholarship for Medical Women

This scholarship, endowed in perpetuity by the gift of £6,000 from Miss Maud Margaret Gibson as a memorial of her father, the late Mr. William Gibson, of Melbourne, is awarded by the Council of the Society on the advice of a Special Committee as provided by the Trust Deed. The income of the fund (after payment of expenses), approximately £290, is awarded for a period of two years (with possible renewal for a third year) to a qualified medical woman upon the nomination of the Scholarship Committee, without examination or thesis.

Dr. Alice Bloomfield has been granted an extension of the William Gibson Research Scholarship for a third year. The next award of the Scholarship will therefore be made in June, 1929.

The Regius Chair of Medicine at Oxford

Sir E. Farquhar Buzzard has been appointed Regius Professor of Medicine in the University of Oxford in succession to Sir Archibald Garrod, who is resigning. Sir Farquhar Buzzard, who was born at the end of 1871, was the eldest son of the late Dr. Thomas Buzzard, one of the leading neurologists in London of his day. Sir Farquhar Buzzard was educated at Charterhouse and Magdalen College, Oxford, where he graduated M.B., Ch.B. in 1898 and M.D. in 1902. He was a student of St. Thomas's Hospital, to which he eventually became physician. He was also at one time attached to the staff of the National Hospital for Paralysis, Queen Square, and was the joint author, with Dr. J. G. Greenfield, pathologist to that hospital, of a work on the *Pathology of the Nervous System*; he has contributed many articles on neurology to the medical press, and in 1907 gave the Goulstonian Lectures to the Royal College of Physicians of London on certain acute infective and toxic conditions of the nervous system. He was president of the Section of Neurology and Psychology of the British Medical Association at the Annual Meeting at Nottingham in 1926, and was a member of the Association's Special Committee on Tests for Drunkenness, which recently concluded its labours. He is a representative of the Royal College of Physicians of London on the General Medical Council; he is physician extraordinary to the King, and received the honour of K.C.V.O. last June. In the nineties he was one of the famous Old Carthusian XI which carried off all the amateur Association football honours.

The following are the Council and Office-bearers of the Royal College of Physicians of Edinburgh for the ensuing year: President: Dr. Robert A. Fleming. Vice-President: Dr. George M. Robertson. Council: Dr. G. Lovell Gulland, C.M.G., Dr. Robert Thin, Dr. John Orr, Dr. William Fordyce, Dr. Edwin Matthew. Treasurer: Sir Norman Walker. Secretary and Registrar: Dr. George Gibson, D.S.O. Honorary Librarian: Dr. Robert Thin. Curator of the Laboratory: Sir Robert Philip. Representative on the General Medical Council: Dr. William Russell. Superintendent of the Laboratory: Lt.-Col. McKendrick. Librarian: Mr. T. H. Graham, O.B.E.

AUSTRALIA

In August last post-graduate lectures were delivered in Melbourne by Professors Chas. A. Elliott and Allen B. Kanavel, both of Northwest University, Chicago. In referring to the large attendance which greeted these speakers, the *Medical Journal of Australia* goes on to say:

An appeal was recently made in these columns to our university medical schools for wider and greater facilities for post-graduate study. Keen practitioners look to the Universities of Melbourne, Sydney and Adelaide for specialized teaching, in order that they may equip themselves with knowledge in the various branches of medicine. The medical student leaves his school after having completed a somewhat ill-planned but comprehensive course. This course has grown by additions to and modifications of an old course which was admirably suited to the amount of teaching demanded. The day of amendment has passed and we await a bold reform of the medical curriculum, the scrapping of the framework and the complete reconstruction of the plan in accordance with modern views and modern knowledge. But even the most ideal course for students can achieve little more than the laying of a foundation of technical knowledge.

GENERAL

Dr. R. E. Wodehouse, Executive Secretary of the Canadian Tuberculosis Association, sends the following statistical table on death rate from tuberculosis throughout Canada.

Provinces	Decrease per 100,000 population 1925 over 1921	Tuberculosis Deaths (All Forms) 1921 Total Deaths	1921 Per 100,000 Population	1925 Total Deaths	1925 Per 100,000 Population	1926 Total Deaths	1926 Per 100,000 Population	Increase per 100,000 population 1926 over 1925	Population 1926
Prince Edward Island	45	128	144	86	98.7	90	103.4	4.7	87,000
Nova Scotia	26	702	134	580	108.0	644	119.2	11.2	540,000
New Brunswick .	6	413	106	405	100.5	417	102.4	1.9	407,000
Quebec	11	2908	122	2937	111	3277	127.8	16.8	2,562,000
Ontario	117	2081	71	1842	59.3	1835	58.3	–1	3,146,000
Manitoba	11	420	69	383	58.3	387	60.5	2.2	*639,000
Saskatchewan ..	2	322	43	344	41.2	382	46.5	5.3	*821,000
Alberta	1	313	53	354	54.2	366	60.1	5.9	*608,000
British Columbia	17	409	78	537	95.7	532	93.6	–2.1	568,000
Canada	7.8	7689	87.6	7459	79.8	7930	84.5	4.7	9,378,000

*Population enumerated in Census of Prairie Provinces, 1926, to nearest thousand.

"The Fifth International Medical Congress for Industrial Accidents and Occupational Diseases" is to be held in Budapest during September, 1928. The Executive Committee consists of the following: President, Dr. Tibor de Verebely, Professor at the university; Vice-President, Dr. William de Friedrich, Professor at the university; Secretary-Treasurer, Privatdozent Dr. George Gortvay, Section Chief.

Addresses and lectures are wanted from American physicians, dentists, and other specialists in the field. Such are requested to get in touch with the chairman of the National Committee for the United States, Dr. Emery R. Hayhurst, Hamilton Hall, Ohio State University, Columbus, Ohio. A general invitation is also extended to attend the Congress, which will be arranged so as to co-ordinate with the "Deutscher Naturforscher Tag" to be held in Hamburg, and the "Orthopädenkongress" to be held at Prague during the month of September, 1928.

The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Senor Alvarenga, and amounting to about three hundred dollars, will be made on July 14, 1928, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in Medicine, but cannot have been published. Essays must be received by the Secretary of the College, 19 South 22d Street, Philadelphia, Pa., by May 1, 1928. Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

The Alvarenga Prize for 1927 has been awarded to Dr. Emil Bogen, Cincinnati, Ohio, for his essay entitled, "Drunkenness."

The Central Information Bureau for all questions dealing with medical studies in Germany is in the Kaiserin Friedrich-Haus, Berlin, N.W.6, Luisenplatz 2/4. The Bureau has an official character and supplies information free of charge. Every doctor who intends to pursue his studies in Germany will do well to communicate with this institution before or immediately after his arrival in Germany.

NOVA SCOTIA

At a meeting of the Halifax Medical Society, held on November 23rd, it was decided that the Society should take the initiative in providing a memorial of the original medical faculty of Dalhousie University. The faculty owed its creation largely to the interest of Dr. (later Sir) Charles Tupper, although he did not become one of its members. As first constituted it was composed of Drs. T. R. Almon, William J. Almon, Edward Farrell, Alexander G. Hattie, Alexander P. Reid (Dean), James D. Ross, Alfred H. Woodill, and Professor George Lawson. When the faculty was organized it was intended that the subjects of the junior years only should

be taught, but the first session (1867-68) proved so successful that it was decided to proceed to a complete course, and the faculty was enlarged to make this possible. Since that time the school has had its ups and downs, and on several occasions the situation was most discouraging, but the spirit of those who originated the school has imbued their successors. To the faith and devotion of these men we owe the present well-established and flourishing Dalhousie medical school, and it is but fitting that a suitable memorial should be erected in recognition of the contributions of the original staff to the cause of medical education.

The annual meeting of the King's Memorial Hospital, Berwick, was held on November 25th. Very satisfactory reports were presented. A feature of the meeting was an address by Dr. O. B. Keddy, of Windsor, who spoke on "Hospitals and their relation to the public." Dr. Keddy commented upon the number of small hospitals which had been established in Nova Scotia within recent years, and pointed out the importance of having such institutions within reasonably easy reach. The service rendered to the community consists of much more than medical and nursing care. The hospital is a centre for social service work. It raises the standard of medical service generally, through the opportunities it gives to the attending physician for meeting and discussing mutual problems. Moreover, the interest of the general public in the hospital brings all classes, creeds, and ages together in work for a common cause, and thus assists in breaking down prejudices and developing a better community spirit. Dr. Keddy hoped that the day would not come when the hospital would be self-supporting. It should always be regarded as a philanthropic, rather than as a money-making institution, and continue to be a stimulus to work on behalf of the less fortunate people of the community.

Dr. J. G. MacDougall, Halifax, has returned from an extended tour of Eureopean centres.

Dr. Philip MacLaren has been appointed assistant physician to the Victoria General Hospital, Halifax.

The house of Dr. Alister Calder, Glace Bay, was badly damaged by fire early in December.

Dr. F. E. Lawlor, Medical Superintendent of the Nova Scotia Hospital, has left for New York, where he will take ship for Panama. He anticipates an absence of some weeks.

Dr. H. M. Jamieson has been appointed to the Dalhousie medical faculty as assistant in Bacteriology, and Dr. Clyde S. Marshall as lecturer in Psychiatry.

The graduating exercises of the training school of the Victoria General Hospital, Halifax, were held on November 21st, when a goodly sized class received the coveted diploma. The principal address of the occasion was delivered by Dr. Alan Cunningham, who gave a most interesting resumé of the history of nursing, and emphasized the responsibilities of the nurse in relation to both patient and physician.

The annual meeting of the Medical Society of Nova Scotia has, for many years, been held early in July. As the seventy-fifth year of the Society's existence is to be celebrated at the next meeting, it was planned to hold the meeting in July at historic Annapolis Royal. The possibility that this might interfere with the attendance at the meeting of the Canadian Medical Association at Charlottetown has led to a reconsideration of the plan, and present indications are that the meeting of the provincial society will be postponed until September.

In order to meet a need of the smaller hospitals, a proposal to arrange a special course in hospital pharmacy is being considered by the College of Pharmacy, Dalhousie University. While arrangements have not yet been completed, it is understood that this course will extend over two years, and will be especially planned for those who intend to devote themselves to hospital work. The superintendents of a number of the hospitals have expressed a desire that such a course should be established, and the college is to endeavour to initiate this new departure at the beginning of the next session.

The vital statistics of Nova Scotia for July, 1927, recently issued by the Provincial Health Officer, indicate that there were 1041 births and 458 deaths during the month. All but fifty of the births reported were attended by medical men. As compared with July, 1926, there was general improvement in the death rate from communicable diseases, with the exception of pneumonia, which gave a much higher rate. Tuberculosis, in all its forms, accounted for 40 deaths as compared with 60 in July of 1926. The infant mortality rate was 57.6—slightly higher than in 1926. Reviewing the diphtheria record for the first six months of the year, in comparison with the same period for several previous years, increased prevalence, increased severity, and a greater mortality rate are noted. This is in keeping with the experience elsewhere.

A fair, conducted in November by the Ladies' Hospital Aid, of Amherst, realized a net profit of more than sixteen hundred dollars for the benefit of the Highland View Hospital.

W. H. HATTIE

NEW BRUNSWICK

A statement issued by Dr. G. G. Melvin, chief medical officer, is of interest regarding typhoid on the north shore of New Brunswick. There have been a number of typhoid cases in East Bathurst, four questionable cases in Campbellton, and several cases in St. Leonard's. The report states that conditions are now much improved. The type of disease has been mild, only one death being reported. It is to be hoped that the medical officer's advice as to chlorination of the water supplies will shortly be implemented.

Dr. H. L. Abramson, Provincial Pathologist, has appeared lately before several of the luncheon service clubs, to deliver a paper entitled "Self Defense", in which he summarizes for the laymen the various measures to be taken by communities to prevent the spread of infectious diseases, laying special emphasis on the prophylactic treatment of small-pox, typhoid, diphtheria, and scarlet fever. From the newspaper interest displayed in these talks, the subject when properly presented is one eagerly accepted by the lay public.

A series of extra-mural meetings for the month of November was held in Woodstock, Fredericton, Moncton, Bathurst, and St. John. Dr. H. A. Farris, Superintendent of the East St. John County Hospital, spoke on "The Differential Diagnosis of Pulmonary Tuberculosis." Dr. Farris, by his close contact with all members of the profession in the province, was greeted

warmly and his subject was handled in a most pleasing and satisfactory manner. In his differential diagnosis he included a detailed discussion of the non-tuberculous chest conditions, such as bronchitis and bronchiectasis. Full emphasis was laid upon the rôle of nose, throat and sinus infections, as a causative factor for these chest conditions. The second speaker was Dr. L. DeV. Chipman, of the St. John General Public Hospital, who spoke on "Infections of the Ear, Nose, and Throat from the General Practitioner's Viewpoint." Dr. Chipman's remarks made a fitting sequel to the address of Dr. Farris and the able presentation of his facts added greatly to the clear understanding of his technical descriptions of diseases of the nose and throat and their treatment.

The Red Cross Society is contemplating the provision of out-post hospitals at Cambridge, Queens Co., Minto, and on the island of Grand Manan. It is to be hoped that their finances will enable them to provide these necessary facilities in such isolated portions of our province.

In the last few weeks, the Tuberculosis Association of New Brunswick has successfully broadcasted appeals for support of the anti-tuberculosis campaign. Dr. W. W. White, Dr. W. F. Roberts, and Dr. H. A. Farris have each spoken on various phases of the work, and their remarks were broadcasted from a local station in St. John.

One of the best known figures in hospital circles in New Brunswick, Miss E. J. Mitchell, has this month, resigned from her position as Matron of the St. John General Public Hospital. Miss Mitchell was a graduate of this hospital in 1895, being a member of the third nursing class. Since that time she has continuously been in the service of her training school—first, as Superintendent of Nurses, and later, as Matron. Miss Mitchell's friends will be glad to learn that she contemplates a prolonged holiday after these many years of useful and much appreciated service.

Dr. C. L. Emerson has resumed his practice in St. John, following an extended and satisfactory surgical post-graduate course at the Polyclinic Hospital in New York.

Dr. L. R. Murray has been elected Mayor of Sussex.

Dr. C. C. Alexander of St. George is a patient at the Chipman Memorial Hospital at St. Stephen, with an infection of the hand. It is reported he is progressing favourably.

Dr. G. G. Corbet of St. John has been elected President of the New Brunswick Division of the St. John's Ambulance Association.

At the present time there are two medico-legal cases before the courts in New Brunswick in which a great deal of the preparatory work has been done in the pathological laboratory of the Department of Health by Dr. H. L. Abramson. This work is time consuming and requires a great deal of attention by the laboratory director. There is also an increasing amount of chemical analysis required by the demands of the prohibition forces with special reference to the alcohol content and potability of seized liquor. This type of work again points to the necessity for the provision of a proper chemical laboratory, under the auspices of the Provincial Government. The condition has been brought to the attention of several members of the Government and it is hoped that such a laboratory will be soon established. This will necessitate the erection of a suitable building to house the various departments of the laboratory work of the Provincial Government.

R. STANLEY KIRKLAND

QUEBEC

Dr. Casey A. Wood, LL.D., who recently returned from the east has left for California, where he will spend the winter, carrying on the work he has outlined in connection with the Smithsonian Institute, and delivering a series of lectures in the Leland Stanford University. McGill is indebted to Dr. Wood, not only for important contributions of priceless volumes to the department of Ophthalmology rendering that section of the medical library one of the most complete in America, but also for the Emma Shearer Wood Library of Ornithology and the Blacker Library of Zoology. During this short visit he has enriched both these libraries with a wealth of material which he has most sedulously collected during his wanderings in Ceylon, Bengal and China. The greater part of his time during his visit here has been spent working very strenuously over the preparation of a catalogue, and annotating the many volumes in various languages and of all ages which he has presented to McGill. During the winter the work started by him, will be carried on by Dr. Willey, Strathcona Professor of Zoology, who will have a number of assistants under him. These two collections, the Emma Shearer Wood and the Blacker now rank in the number of the volumes and high character of their contents with the libraries of the Smithsonian Institute and of the British Museum. It is hoped that the cataloguing will be completed by the end of next summer, and when published this catalogue will be of great value to librarians everywhere.

The Executive Committee of the city of Montreal appointed Dr. A. Bolduc as city Bacteriologist. Dr. Bolduc has been acting in that capacity for the last six months. It has been decided to make the department a paying one. The city will, in future, charge for analyses which are made, except in cases where the very poor are concerned.

GEORGE HALL

ONTARIO

Dr. John S. Schram, of London, Ont., a Western graduate, has recently been awarded a Carnegie Medal for his gallant rescue of Howard Bailey from drowning. Bailey, though an expert swimmer, ventured too far into the chilly waters of Lake Huron. Not being accustomed to lake swimming, particularly at a time when the lake was rough, young Bailey underrated the current and was soon in distress. Dr. Schram, swimming over a safer course, became aware of the situation and bravely swam to assist, though the waves were

rolling four and five feet high with a terrific undercurrent running. After great difficulty the youth was subdued and towed ashore. In the ensuing struggle the doctor was severely injured, the result being an operation and a year of partial disability.

The gallant deed was also recognized by the Y.M.C.A. Council, from which the doctor received the highest award of that organization—a gold medal.

A very interesting meeting of the Western Ontario Academy of Medicine was held in London on November 30th. The following addresses were given: "Insulin and the mortality from diabetes", by Dr. I. M. Rabinowitch, of the Montreal General Hospital; and "The treatment of some of the commoner fractures," illustrated by lantern slides, by F. J. Tees of Montreal. In spite of bad weather, there was an attendance of over 80 at the meeting, which was voted one of the best ever held in the history of the academy.

The Porcupine District Medical Society met at Timmins on Friday, November 25th, when an address on "Fractures", with lantern slide illustrations, was given by Dr. J. W. Ross, of Toronto. The following officers were elected for the ensuing year: President, Dr. J. A. McInnis, Timmins; Secretary-Treasurer, Dr. J. E. Barry, Schumacher.

On November 1st, at a meeting of the Middlesex County Medical Association held at Glencoe, the following addresses were given: "The management of certain obstetrical emergencies", Dr. W. P. Tew, London; and, "High blood pressure and arteriosclerosis", Dr. William Goldie, Toronto.

The Victoria County Medical Society met at Lindsay on November 4th. The following addresses were given: "Infantile paralysis", Dr. C. S. Wright, Toronto; and "The anæmias", by Dr. Norman B. Gwyn, Toronto.

At a meeting of the Renfrew County Medical Society, held at Renfrew on November 15th, Dr. G. C. Brink, of the Provincial Department of Health, gave a talk on "Tuberculous lesions of the chest in child and adult." This was followed by an illustrated talk on "Fractures" by Dr. M. H. V. Cameron of Toronto.

Dr. Goldwin Howland, of Toronto, addressed the Hamilton Medical Society on November 16th, his subject being, "Methods of investigating functional nervous disorders", after which a clinical case was presented by Dr. S. H. O'Brien of Hamilton.

The Bruce County Medical Society met at Walkerton on November 17th, when an address was given by Dr. C. S. Wright, of Toronto, on "Infantile paralysis", followed by a talk on "The management of certain obstetrical emergencies" by Dr. J. C. S. Battley, of London.

At a meeting of the Kent County Medical Society, held at Chatham on November 24th, Dr. A. J. Grant, of the University of Western Ontario, London, gave a talk on "Neoplasms of the female breast—differential diagnosis and treatment." This was followed by an address from Dr. Geo. C. Hale, of London, on "Diseases of the heart."

The Ontario County Medical Society met at the Ontario Hospital, Whitby, on November 30th, when Dr. M. H. V. Cameron, of Toronto, gave a talk on "Fractures", illustrated by lantern slides.

On Friday, December 2nd, at a meeting of the Sudbury Medical Society, Dr. Roscoe Graham, of Toronto, gave an address on "Goitre".

A meeting was called in the town of Milton, on Tuesday, November 29th, for the purpose of considering the organization of a medical society for the County of Halton. There was a very excellent attendance, sixteen in all sitting down to dinner. After a good deal of discussion, in which every doctor present took part, it was unanimously decided to organize a Halton County Medical Society. The following officers were elected: President, Dr. M. E. Gowland, Milton; Vice-President, Dr. A. McAllister, Georgetown; Secretary-Treasurer, Dr. J. L. Sutherland, Milton; on Executive Committee, Dr. J. H. Stead, Oakville, Dr. T. W. Peart, Burlington. Dr. F. B. Mowbray, of Hamilton, who was present, gave a very excellent talk on the subject of "Goitre". His presentation elicited keen discussion from those present. The meeting was attended by Dr. J. H. Holbrook, Hamilton, Counsellor of the District, and Dr. T. C. Routley, Toronto, Secretary of the Ontario Medical Association. Every indication points to the Halton County Medical Society becoming a very active organization.

The Haldimand County Medical Society, which has not been active during the past two or three years, decided to re-organize. For this purpose, a dinner was held in Dunnville on Tuesday, December 6th, with twenty-six practitioners present, representing not only the county, but a number of visitors from Welland, Hamilton, and Toronto. Dr. Herbert Walker and Dr. Chas. F. Abbott, of Dunnville, were duly elected President and Secretary respectively, and were promised the hearty support of the men of the county in their attempt to revive interest in the Society. During the course of the evening, an excellent paper was presented by Dr. W. J. Deadman, of Hamilton, on "The laboratory as an aid to the practitioner". Addresses were also given by Dr. J. H. Holbrook of Hamilton, Counsellor of the District, and Dr. T. C. Routley, Toronto, Secretary of the Ontario Medical Association. The Haldimand County Medical Society is once again off to a good start, and arrangements are under way for a series of meetings to be held during the coming year.

On November 28, 1927, Dr. Norman Gwyn, of Toronto, addressed a combined meeting of the Rotary Club of Simcoe and the Norfolk County Medical Society. Dr. Gwyn spoke on the early life of Osler, pointing out the individualism of the great teacher. Simcoe Rotarians were very much pleased with Dr. Gwyn's address, and the members of the Norfolk County Medical Society, who were the guests of Dr. W. A. McIntosh, president of the Rotary Club, expressed themselves as glad to hear Dr. Gwyn's remarks. The County Society had 100 per cent attendance.

The Academy of Medicine, Toronto, has completed the installation of a Telephone Exchange which is listed in the Toronto Telephone Directory under the heading of the Academy of Medicine Doctors' Exchange, Kingsdale 1134. Any Fellow of the Academy may be located through this exchange. Information is available at the Academy of operations being performed at all city hospitals, medical meetings and other activities of interest to the profession. Out-of-town physicians are cordially invited to avail themselves of this exchange.

N. B. GWYN

MANITOBA

Hon. Dr. E. W. Montgomery, Minister of Public Welfare, and Dr. D. A. Stewart, addressed the Union of Manitoba Municipalities at the annual meeting in the Fort Garry Hotel, Winnipeg, on November 29th. The new cabinet minister stressed the importance of preventive medicine, and urged periodical health examinations; Dr. Stewart outlined the work being accomplished at the institution. Interesting moving picture films showing patients being cared for were exhibited and were greatly enjoyed. Ex-Alderman A. M. McFadyen, president of the Union, moved a vote of thanks to the speakers.

In the Provincial Legislature, Dr. E. J. Rutledge, member for Minnedosa, recently called attention to the faulty medical inspection of immigrants. The inspection of immigrants from Norway by Norwegian physicians apparently left much to be desired.

At the sectional meeting — Minnesota, North Dakota and Manitoba—of the American College of Surgeons held at Duluth, Minn., on November 17th and 18th, Manitoba was represented by Dr. J. S. Matheson of Brandon, and Dr. Neil John Maclean of Winnipeg. The latter gave an address on "Tumours in the left upper abdomen."

Victoria Hospital, Winnipeg, has acquired the hundred feet immediately west of the hospital at 426 and 428 River Ave. There is a solid brick double house on the property and this has been connected to the hospital by a tunnel and after renovation will be used as a nurses' home. The sixth floor of the hospital building will then be converted into a public ward of about twenty beds.

Grace Hospital, Winnipeg, has installed heating plugs for doctors' automobiles.

William Speechly, a son of Dr. H. M. Speechly, of Winnipeg, and a student at Cambridge, has been chosen as goal keeper for the English Olympic Hockey Team. Last year he was goal keeper for the Junior Varsity team.

Congratulations are being extended to Dr. William Turnbull of Winnipeg, on the selection of his son, David, as Rhodes Scholar for Manitoba. Mr. Turnbull is Senior Stick in the University of Manitoba from which he will graduate this spring. He has had a distinguished career both as a scholar and an athlete. While at St. John's Technical High School he won the Governor-General's medal and in the University he has taken a high place in his honour subject, mathematics. He was a member of the Junior Varsity Rugby team last year, and this year was a member of the track team which won the inter-university championship at Edmonton.

At the meeting of the Winnipeg Medical Society on December 16th, Dr. F. G. McGuinness read a very interesting paper based on his work in the prenatal clinic of the Winnipeg General Hospital on "Version in breech presentation." Equally interesting in another sphere was a paper by Dr. T. G. Hamilton on "Teleplasm," illustrated with numerous lantern slides. The following were elected members of the Society. Drs. M. S. Hawke, R. W. McCharles, E. Etsell, S. Meltzer, K. Borthwick, D. Nicholson, J. A. MacDougall, Graham Wilson, A. J. Swan, H. D. Isaacs, John McEachern, A. W. Hicks, J. G. M. La Fleche, W. M. Musgrove, S. Easton.

ROSS MITCHELL

SASKATCHEWAN

Dr. W. A. Plourde who has practised for the last eight years at Lebret was instantly killed by the accidental discharge of a shot gun. The shot tore its way through the upper part of his body when the trigger caught in a barbed wire fence he was crossing while out hunting. Dr. Plourde came to this province from Quebec, eight years ago.

Dr. J. Fyfe, died at Kenaston, Thursday, December 1st. He made a call in the night and complained of illness, during the night he had another attack. Thursday morning, while attending a case he had a further attack and all efforts to revive him were without avail.

Dr. C. H. Carruthers, Star City, is taking post-graduate work and expects to be absent from the province about six months.

The Regina District Medical Society held its last meeting, following a dinner, in the Kitchener Hotel, December 7th. A paper was presented by Dr. Chalenger, pathologist of the Regina General Hospital on the "Classification of nephritis from a chemical standpoint." Drs. U. J. Gareau and Beattie Martin presented a case of "Progressive dystrophy."

Dr. S. E. Holmes has opened up a practice at Wadena.

Dr. E. W. Stewart, late of Wadena has left the province.

Dr. J. W. Huykman of Verwood has moved his office to Vibank.

Dr. G. B. Mills of Galahad and Czar, Alberta, has moved to Senlac, Saskatchewan.

Dr. A. L. H. MacNeil of Cabri, is now doing post-graduate work at Rochester and Chicago.

ALBERTA

Dr. Morley Salmon of Calgary, who has been seriously ill for the past two months, though still confined to his home, is making steady progress towards a return of health.

Dr. J. S. McEachern, of Calgary, has recovered from his prolonged illness, and is spending some weeks in California.

At the first meeting of the session for 1927-1928 of the Calgary Medical Society, held at the Holy Cross Hospital on October 4th, Dr. Euston Sisley addressed

the members on the subject of "The significance of cholesterol to the human system."

On November 1st, Dr. D. R. Dunlop gave a most interesting account of the "Life and work of Louis Pasteur" to the members of the Calgary Medical Society. We regret to learn that shortly after his address he was taken seriously ill; but is now slowly recovering.

Dr. G. W. Leech has removed from Carmangay to Raymond where he has been appointed Medical Officer of Health, and surgeon to the sugar factory.

Dr. Robert Elder, who has been practising in Macleod, has disposed of his practice. He intends settling in Quebec after he has spent some time in post-graduate work. Dr. M. J. Brayton, of Warner, will take over his practice in Macleod.

According to a report from Lethbridge, there was not as large an attendance as was expected at the lectures and clinics of Professors McKay and Burridge of Winnipeg, owing to the unusually severe winter weather, yet the instruction was exceptionally well worth while, and everyone present enjoyed their interesting and instructive addresses.

Dr. K. I. Murray, formerly of Raymond, Alberta, latterly practising in British Columbia, has taken over the practice of Dr. M. C. Burke of Blackie, who has gone east to take up post-graduate work.

The Roman Catholic Sisters who were at Stettler have decided to move to Galahad, where they are building a hospital. Dr. G. N. Maynes, who has been practising at Carstairs, has also moved to this point.

Dr. Walter Morrish, formerly of Smoky Lake, has returned from England after a period of study at Cambridge University, where he obtained a diploma in radiology and electrotherapeutics. He will practise in Edmonton, devoting himself to x-ray work and electrotherapeutics.

The following physicians have recently been registered in Alberta with the College of Physicians and Surgeons: S. W. Leiske, College of Medical Evangelists, California, now at Calgary; Emma M. Johnstone, a graduate of Edinburgh University, Glasgow College of P. and S., and of Cambridge University, now at Rife, Alberta; S. H. McLeod, McGill University, now at Coronation, Alberta; A. J. Cook, Manitoba University, now at Alliance, Alberta; G. C. Haworth, Alberta University, now at Banff, Alberta; H. A. Creighton, Dalhousie University.

Dr. F. L. Murray, of Athabasca, owing to the strenuous life associated with arduous drives in the far northland, has been obliged to take a month's rest in one of the Edmonton hospitals.

During the second and third weeks of November, the medical profession of Alberta had the pleasure of attending lectures and clinics by two well known representatives of the University of Manitoba, Dr. D. S. McKay, O.B.E., F.R.C.S. (Edin.), F.A.C.S., Associate Professor of Gynæcology, and Dr. H. J. Burridge, F.A.C.P., Associate Professor of Medicine.

These were given under the auspices of the Canadian Medical Association, from the special grant for extra-mural post-graduate work, and were the fourth of this year's series. Too much praise cannot be given to those responsible for this method of keeping physicians abreast of the times in medical knowledge. Each tour in this province has been well-organized, and we have been fortunate in having clinicians of exceptional merit who all have given instruction of a high standard of quality. The present tour has been a most successful one. Various points were visited by Professors McKay and Burridge, including Medicine Hat, Lethbridge, Calgary, Drumheller, Stettler, Lacombe, Edmonton, St. Paul, and Vegreville. Owing to severe weather conditions, with heavy roads, which made travelling difficult, the meetings in some centres were not so large as expected, yet much interest and appreciation of this excellent series of lectures and clinics were shown by physicians throughout the province. In Calgary, a clinic on "The Cardiac Complications of Toxic Goitre" was given by Professor Burridge, and a lecture by Professor McKay on "Pelvic Infection" at the Holy Cross Hospital during the morning of November 11th; and lectures in the afternoon by Professor Burridge on "The Present Status of Digitalis Therapy," and by Professor McKay on "Perineal Lacerations, Complications, and Sequelæ."

For a number of years it has been felt that the Calgary Municipal General Hospital building was inadequate to meet the demands for the accommodation of patients, particularly in the Maternity Department, where only a comparatively small number of patients can be cared for. Moreover it is recognized that it is unsuited for a maternity ward, and an addition to the Nurses' Home is also required. The hospital building, which was erected in 1912, is comparatively new, yet cannot be called modern and up-to-date, since it lacks many of the facilities necessary for efficient hospital nursing and the care of patients. The present necessity for better and larger accommodation was recently brought before the City Commissioners and Alderman. Plans had been prepared by an architect for a new wing to the western portion of the building, which would combine modern ideas in hospital facilities, as well as ample room for accommodation of patients, at a cost of $200,000. After a thorough discussion, it was felt that it would be better to erect, at some future time, a thoroughly modern structure, complete in all details, which it is estimated will cost between $1,200,000 and $1,500,000. It is greatly to be hoped that the building of such a necessary structure will not be long delayed.

The Council of the College of Physicians and Surgeons of Alberta is holding elections in the near future at (1) Medicine Hat; (3) Red Deer-Banff; (5) Peace River; and (7) Edmonton. The affixed numerals represent various districts. The province is divided into seven constituencies for these elections. Four elections are held one year and three the next. The members elected hold office for two years, but are eligible for re-election. The odd-numbered ridings elect their representatives in the odd year, and the even-numbered in the even years. By holding an election in half of the ridings annually the profession has an opportunity to give expression to its convictions regarding the work done by the Council.

The appointment of Professor J. B. Collip, of the University of Alberta, to the Chair of Biochemistry in the Medical Department of McGill University, to succeed Professor A. B. MacCallum, will be a source of satisfaction mingled with regret to his many friends and admirers in this province. Coming to the University of Alberta five years ago, following his epochal work in connection with the discovery of insulin, Professor Collip has found time in which to continue his research work and isolate the parathyroid hormone, as well as carry on investigations along other lines. Endowed with a brilliant mind and with the spirit of the keen research worker, Professor Collip, who is but a comparatively young man, should in his

new sphere of action shed lustre on McGill University. Though he will not take up his new duties until next June, yet he will have the best wishes of those who have known him in Alberta.

The annual meeting of the Alberta Hospitals' Association, in conjunction with the meeting of the Association of Registered Nurses, was held in Edmonton on November 21st, 22nd, and 23rd, under the presidency of Dr. H. R. Smith of the Royal Alexandra Hospital, Edmonton. Among the speakers was Dr. E. A. Braithwaite, of Edmonton, Government Inspector of Hospitals and Chief Coroner, who spoke on "The regulations of the conduct and management of various hospitals in the province", in which he gave a summary of his work as a hospital inspector and chief coroner. He stated that the regulations were not difficult to understand. They were based on the rules of strict commonsense, and with their application every hospital in the province would soon be given a proper rating. He gave some hints on how to secure a perfect staff, and said that no hesitation should be shown in changing the staff when it was found to be necessary.

Dr. M. T. McEachern, of Chicago, Director of Hospitalization for the American College of Surgeons, was a guest of the Association and took part in the discussion of various papers and round-table meetings. He also spoke at the Board of Trade luncheon, giving a brief but comprehensive summary of the latest developments in hospital structure, maintenance, and organization. Hospital standardization, which the American College of Surgeons, is working for, makes for the utmost efficiency in hospital procedure and organization; treatments are being standardized.

The modern tendency in hospital architecture is toward tall narrow buildings which will give the maximum of light and air. They are furnished and decorated with bright homelike colours, the depressing effects of bare white walls having at last been recognized by the medical profession. A congenial atmosphere is provided for nurses and internes, and in general everything possible is done to make modern hospitals pleasant and cheerful. Dr. McEachern expressed his belief that everyone who valued his or her health should choose a reliable family doctor and go to him at least once a year for a thorough examination.

Dr. M. A. R. Young, of the Lamont General Hospital, gave a paper on "Some of the difficulties which confront the smaller hospitals in the province in x-ray work."

Dr. G. H. Malcolmson, of the Royal Alexandra Hospital, Edmonton, gave an address on "Some aspects of x-ray work."

Dr. A. H. Baker, the new president of the Hospitals' Association, spoke about the great improvement in health conditions in this province as compared with those which prevailed in former times.

Dr. M. R. Bow, Deputy Minister of Health in Alberta, addressed the meeting on the subject of the work being done in his own department of the province.

Dr. T. H. Whitelaw, of Edmonton, spoke about the rôle the public hospitals played in the preventive treatment of disease, which subject he dealt with fully.

Among the officers elected for the ensuing year in the Alberta Hospitals' Association were: Honorary Presidents, His Honour Lieut.-Governor D. William Egbert, and Dr. M. R. Bow, Provincial Deputy Minister of Health. President, Dr. A. H. Baker, Superintendent of the Keith Sanitorium. Executive Committee, Dr. R. T. Washburn, Edmonton, Dr. D. Gow, Calgary, and Dr. H. R. Smith, Edmonton. Calgary will probably be the next place of meeting.

Among the officers of the Alberta Public Health Officials' Association, recently organized at Edmonton, are the following: Honorary President, Hon. Dr. M. R. Bow, Provincial Minister of Health. President, Dr. T. H. Whitelaw, Edmonton. First Vice-President, Dr. Duncan Gow, Calgary. Secretary-Treasurer, Dr. Jenkins, Medical Inspector of Health for Alberta.

G. E. LEARMONTH

BRITISH COLUMBIA

The regular monthly meetings of the Fraser Valley Medical Society have been very well attended this fall, and a good deal of interest has been taken in both the lectures and the clinics. On November 8th Dr. J. Christie of Vancouver, gave an address on the subject of "Skin diseases in general practice." On November 22nd the evening was devoted to the study of the kidney, its anatomy, physiology and pathology, with discussion of the more recent renal-function tests and differential diagnosis of nephritis and nephrosis. The clinic was in charge of Dr. E. H. McEwen, of New Westminster. Dr. Theo H. Lennie, of Vancouver, took as his subject "Toxic goitre" at the meeting held on December 6th.

The November general meeting of the Vancouver Medical Association was held on the first of the month. Dr. A. B. Schinbein delivered his presidential address. An extraordinary resolution was unanimously carried that a Standing Committee on Hospitals be added to the many activities of the Association. The duties of this Committee are to keep the Association advised and enable it to take the lead in the development of the hospital situation in Greater Vancouver, to promote hospital efficiency, and to take care of the members' interests in all matters relating to hospitals. A resolution was carried establishing a Pædiatric Section of the Association.

Dr. W. E. L. Middleton of Victoria, B.C., late of Montreal, is now practising in Vancouver.

The following letter was received by the B. C. Medical Association from the Secretary of the British Columbia Hospitals' Association:—

"At the 1927 Convention of the British Columbia Hospitals' Association, held in Victoria, the following resolution was presented and carried unanimously, and I take pleasure in advising you of the same as directed.

'It having come to the observation of this Association of the kindness and prompt attention afforded by the physicians and surgeons of this province in the hospitals and in the out-lying districts in rendering aid to the sick without consideration as to remuneration, that this Association goes on record as expressing their deep appreciation of the services rendered, and that a copy of this resolution be sent to the British Columbia Medical Association'."

EWART CAMPBELL

UNITED STATES

THE AMERICAN BOARD OF OTOLARYNGOLOGY

On June 11, 1928, examinations will be held in Minneapolis, for the Fellowship of the American Academy of Ophthalmology and Otology, at the session of the American Medical Association, and in St. Louis, on October 15th, during the meeting of the Academy.

Prospective applicants for certificates should address the Secretary, Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, for proper application blanks.

The Desert Sanatorium announces the appointment of Dr. Roland A. Davison, formerly Chief of the Division of Gastro-Enterology and Metabolism at the Letterman General Hospital, San Francisco, California, as Assistant Medical Director.

Book Reviews

The Meningiomas Arising from the Olfactory Groove and Their Removal by the Aid of Electro-Surgery. Macewen Memorial Lecture, 1927. By Harvey Cushing, C.B., D.S.M., A. M., M.D., LL.D., Professor of Surgery in Harvard University. 53 pages illustrated. Price 2/6 net. Jackson, Wylie, & Co., Glasgow.

"In this field of neuro-surgery a technique utterly different from that usually employed by the general surgeon is essential for success." And as one reads and ponders the fifty-three pages of this book, the truth of this generalization of Dr. Cushing's is grasped. When the author tells us of operations he performed for the removal of meningiomas which consumed five, seven, and nine hours in their performance, we get a new idea of how comparatively insignificant time may be when the operative technique is above suspicion. At least, it would seem so in brain surgery. The man with only abdominal experience may gasp at a nine hour operation. But his path lies in easier and wider fields than those pillared, confined and mysterious chambers, through the mazes of which the very angels must pick their steps. Here as elsewhere results are supreme; and on this basis Dr. Cushing's long one-stage operations rest secure.

Dr. Cushing furnishes most convincing evidence of the advantages of "Electro-surgery" in the removal particularly of meningiomas. The old and bloody technique of a three stage operation, with cutting instruments, is set up against the one stage and comparatively bloodless procedure with a specially devised instrument. The odds are all with the electro-surgical technique, and one can easily agree with the author that "it constitutes a surgical tool which bids fair to replace the scalpel in certain fields of work." While meningiomas in general are discussed, the central subject of the work is confined to those of the olfactory groove.

This book is the Macewen Memorial Lecture of 1927, delivered in Glasgow. As might be expected, the inspiring significance of such an occasion could not be lost on even a less receptive mind than that of the brilliant American surgeon. Amid the medical traditions of Strathclyde Dr. Cushing found an intellectual urge, which enabled him to call back to their rightful place in "the great procession" the mighty pioneers in medicine and surgery who were born and bred in this historic Scottish valley. Lowe, Smellie, Cullen, Black, the immortal Hunters, Macewen, et al, an inspiring theme surely, and the Lecturer shows clearly his reaction to the spell of environment.

Macewen's great pioneer work in brain surgery is well defined, and a striking recognition of his worth is given by the Lecturer, who places him as one of the two (the other is Horsley) pillars which support "the arch of modern neurological surgery." The illustrations and printing are excellent.

To the neurologist and neuro-surgeon this book makes a special call, but no member of our calling should deny himself the delight and benefit of a perusal.

GEORGE H. MURPHY

Exposures of Long Bones and Other Surgical Methods. Arnold K. Henry, M.B., B.Ch., F.R.C.S.I. Chevalier, Legion d'Honneur; Professor of Clinical Surgery, Royal School of Medicine, Cairo. 80 Pages, 51 illustrations. Price 10/6 net. John Wright & Sons, Bristol, 1927.

This book comes to us from a land where the traditionary history of surgery relates how one Faith Liag, in the first century, extracted a "brain ball" from the brain of Conor MacNessa, King of Ulster. The lesion resulted from an argument between the king and a neighbouring ruler, the *modus disputandi* being something after the fashion of the David-Goliath incident. There is however nothing remote or visionary in the little book before me. The greater part of the work fairly bristles with things practical and of deep interest to the general surgeon. It is well printed, has good illustrations, and the text runs to eighty pages.

The book is divided into two sections. The first deals with exposures of long bones, which, of course, meet all operative purposes. Nowhere has one seen surgical anatomy applied more ingeniously. The author states that he was led to search out new routes to the bones after losing a patient from hæmorrhage, in an operation on the femur in which he followed the usual external lateral procedure. The method he devises approaches the bone through an anterior incision, and, by what seems a very simple bit of anatomical side-stepping, the blood vessels and nerves are avoided, and access is found to the whole or any part of the femur. One begins to realize what a real distinction there may be between a knowledge of anatomy and its detailed application in a particular operation. Every movement of the scalpel follows an anatomical signal which saves the tissues from a lot of unnecessary cutting, hæmorrhage, and consequent weakening of function. Exposure of the other long bones follows the same principles. Inferentially, one detects here the urge to seek after perfection in what erstwhile might have been thought a more or less rough and easy department of operative surgery.

The author assumes heavier problems in the second section. Resection of the sympathetic ganglion, and, pituitary surgery by a new method, can be appraised only by those with experience in such work. But the average surgeon can see ample evidence of a keen spirit of investigation, and, as in the first section, great attention to details. The rest of the section is well in the field of the general surgeon and is satisfactory from all angles.

A foreword by Sir William DeC. Wheeler, of Dublin, gives the stamp of commendation of a well known and popular authority to the work.

This little book will be taken down from the book shelf oftener, and with more benefit, than many a more pretentious volume.

GEORGE H. MURPHY

Orthopedic Surgery. Royal Whitman, M.D., M.R.C.S., F.A.C.S. Eighth edition. 1061 pages, 954 engravings. Price $9.00. Lea & Febiger, Philadelphia, 1927.

We welcome the eighth edition of "Orthopedic Surgery" by Royal Whitman of New York, for his life time surgeon to the Hospital for the Relief of the Ruptured and Crippled. The first edition was published in 1901, and dedicated to Virgil P. Gibney of New York, Dr. Whitman's chief at that time. The book has been a standard one since its appearance twenty-six years ago, and has the unique advantage of exhibiting continuity of personal service and experience at the hands of a master of his craft. This new edition, published as before by Lea and Febiger of Philadelphia, has been revised throughout by the author. Dr. Whitman's ability as a teacher is shown by the concise and practical nature of his descriptions, while the increasing years of his active service in the famous hospital of which he is the chief, have not, one is glad to note, diminished the keenness with which he discusses the latest procedures. One observes many new illustrations, especially in connection with such operations as those for arthroplasty. Dr. Whitman's own principal contributions to orthopædic surgery, notably astragalectomy, the abduction treatment for fractures of the neck of the femur, and the reconstruction operation at the hip joint, receive merited attention.

One is impressed not only by the encyclopædic nature of the volume, covering it would seem every possible orthopædic subject, but by the sane and well balanced nature of the descriptions and treatment advised. The author has never been known to launch out into a sea of theory, and write a book to enlarge upon his views. The chapter on collateral orthopædic surgery, previously entitled military surgery, contains a large amount of material on fractures, nerve grafting, compensation tables, etc. There is a good index. The book is highly recommended to students and to those practising orthopædic surgery. J. A. NUTTER

Insurability. Prognosis and Selection. H. W. Dingman, M.D. 706 pages. Price $15.00. The Spectator Co., New York, 1927.

This is a unique contribution to the literature on longevity, with particular reference to life insurance, which aims to bring together in readily accessible form much data which otherwise must be found by delving in many places. Necessarily, it is sketchy, though the work runs to over seven hundred pages.

The book is one which will be of use mainly to medical advisers of life insurance offices, and to some extent to actuaries, though the ordinary disciple of clinical medicine may find much interesting and valuable information on the subject of longevity. He who wants to familiarize himself with the actuarial principles on which the whole structure of life insurance rests will have to look elsewhere, and much of the text will be difficult of understanding until a smattering of actuarial information has been acquired.

Part I is introductory and deals with fundamentals. There is the usual clap-trap about the value of human life, based on the earning power of the individual,—as if that were an accurate index to the value of the person to his fellows. A historical note on the methods employed by life-offices in the earlier days of the business, in weeding out those deemed unsafe for insurance, will be interesting. A very effectual chapter is devoted to the "numerical" method of appraising probable longevity, invented by Mr. Arthur Hunter and Dr. Oscar H. Rogers, a method which operates by giving debit marks for features likely to shorten life, and credit marks for those factors conducive to lengthening it, the magnitudes of the debits and credits being so arranged that their algebraic sum is a measure of the percentage deviation of the expected mortality rate from normal; thus, a sum of 125 indicates an expected mortality of 25 per cent above normal.

The chapter on Life-Tables contains much historical material, with comparisons of the mortality rates probably obtaining at various periods, ancient and modern. No attempt is made to describe the anatomy of life-tables in general, and for a working knowledge of this important subject the reader must consult other authors.

Part II.—"Personalities"—deals with the person making the proposal for insurance, the agent, the medical examiner, the head office officials, and obviously has reference to insurance practices in America (U.S.A.) rather than in England, or even in Canada.

Part III.—"Elements of Insurability"—To the ordinary medical reader this part will be of very great interest;—sex, age, build, habits, family history, habitat, —are dealt with in detail. Here there is a wealth of information for any person, lay or medical.

Part IV.—"Prognosis"—is very much like the many medical works on life insurance which have appeared before. Outside of the data on mortality rates obtaining in various diseases, there is not much for the well-informed medical reader. Non-medical persons, interested in life insurance, will find this part of value for quick reference purposes.

The author is to be congratulated mainly on the extent of his references, these forming a bibliography of medical and also actuarial material of really huge extent. In number the references run literally into hundreds.

As for literary style, it is unfortunately absent. There is a striking slovenliness in sentence construction and in the use of words, which is astonishing in an otherwise meritorious production, on which a colossal amount of work must have been expended. Most of the abominations of medical slang are of frequent occurrence, and the words "pathology," and "psychology", are misused with annoying frequency. C. C. B.

The Queen Charlotte's Practice of Obstetrics. By members of the Hospital Staff. J. Bright Banister, M.D., F.R.C.S., Aleck W. Bourne, M.B., F.R.C.S., and others. 628 pages, 270 illustrations. Price $5.50 The Macmillan Co. of Canada, Toronto, 1927.

This volume, written by six members of the staff of the oldest maternity hospital in the British Isles, is undoubtedly a valuable addition to obstetrical literature. Its composite authorship precludes any material of debatable value being included, but opposing views are apt to creep in, as indeed is the case in the discussion of the most desirable anæsthetic for Cæsarean section.

The book is divided into ten main section, preceded by an historical note on the Queen Charlotte Hospital. The opening chapters deal briefly with the development of the ovum and the anatomy of the pelvis. A well-written chapter on the value of antenatal care follows, in which the author states that 80 per cent of the deaths from eclampsia are preventable by efficient antenatal supervision. Then follow chapters on the pathology of pregnancy and the conduct of labour, whether normal or abnormal. The chapter on eclampsia is interesting, but one misses any discussion of the Stroganoff method which is so widely employed nowadays. Contracted pelves are discussed in a very brief chapter, the "male pelvis" as a cause of dystocia is not mentioned.

The book is clearly printed on good paper, and the illustrations are well chosen and add much to the clarity of the text. ELEANOR PERCIVAL

The Science and Practice of Surgery. W. H. C. Romanis, M.A., M.B., M.Ch., F.R.C.S., F.R.S., Senior Surgeon in Charge of Outpatients, St. Thomas's Hospital, and Philip H. Mitchiner, M.D., M.S., F.R.C.S., Surgeon in Charge of Outpatients, St. Thomas's Hospital. Vols. I and II. 1750 pages, 666 illustrations. Price $4.25 each volume. The Macmillan Co. of Canada, Toronto, 1927.

This two-volume work on surgery is possibly one of the best of its type published within recent years. Volume I. deals with general surgery, while Volume II treats of regional surgery. Both are written in a clear readable style, the subject matter being particularly well apportioned. The work should be specially suitable for under-graduate students and for general practitioners who require a ready reference in concise form. Any criticism that may be offered would be on minor points and constructive in its aims. There appears to be, here and there throughout the work, too much attention given to the elaboration of principles of technique and treatment which we, as modern surgeons, now consider of historical interest only, while, on the other hand, one is disappointed to find an almost total absence of any consideration of recent experimental work which has had, and is having, a very great influence on surgical results. This latter point is particularly noticeable, not only in the pre-operative management of goitre, but in the pre-operative, operative, and post-operative management of intestinal obstruction, a condition in which, within recent years, the study of blood-chemistry and its practical application has been so valuable. On the whole, however, this is a very worthy treatise on surgery and can be recommended without reserve to both students and practitioners. R. V. B. SHIER

Diseases of the Nose, Throat, and Ear for Practitioners and Students. Edited by A. Logan Turner, M.D., LL.D., F.R.C.S. (Ed.), and others. 440 pages, 234 illustrations. Second edition. Price 20/- net. John Wright & Sons, Ltd., Bristol, 1927.

This book needs no introduction to the laryngologist. Of the second edition now issued, little can be said but praise. It is divided into six section, the Nose, Accessory Sinuses, Pharynx and Nasopharynx, Peroral Endoscopy, and the Ear. It is profusely illustrated, and contains many beautifully coloured plates.

The anatomy of the nose, including the lymphatics and secretory nerves, is well described by Dr. Gardiner. Sluder's operation upon the ethmoidal labyrinth, and West's operation (intra nasal dacryocystostomy), with their indications, are clearly stated. The latter operation is stated to have been followed by 75 per cent of cures. A needful warning against an exaggeration of the importance of the nose, as a cause for some of the systemic diseases attributed to it, is given.

Dr. Turner has written the section on the nasal accessory sinuses. His wide knowledge and his study of the comparative anatomy of these sinuses in various races makes this section extremely interesting and valuable. As alarming symptoms and some fatalities have followed antrum irrigation, a clear warning against inflation of air into the sinus is given.

The article upon the pharynx and nasopharynx has been contributed by Dr. Guthrie. The many questions, which have arisen in late years, regarding the tonsils and adenoids are fully discussed. He advocates ethyl chloride anæsthesia for tonsillectomy in children.

Dr. Lithgow's description of the larynx is very clear. The anatomy, the appearances, and the diagnosis of the different laryngeal lesions will prove of great value to specialists as well as to students. His comment that operations upon the larynx by indirect laryngoscopy are rapidly becoming a thing of the past is interesting.

The article upon peroral endoscopy, by Dr. Ewart Martin, aims at describing the signs and symptoms of the various lesions requiring diagnosis and treatment, rather than instructing the reader in this highly specialized department. His statement that the probang and coin catcher are things of the past, and that they often prove more fatal than the foreign body for the removal of which they are intended, is now almost universally accepted.

A more concise and clearer article on the ear than the one written by Dr. Fraser we have not seen in any text-book. Dr. Fraser has illustrated his section on the labyrinth by numerous diagrams and reproductions of the microscopical sections of his own cases, many of which he so well described when in America several years ago. An interesting account of oto-sclerosis is given and the various theories as to its cause discussed. The use of insulin and an appropriate diet in acute mastoiditis, as it occurs in diabetics, are briefly described.

The whole book is well written and is a fund of information which will be of great value to both students and specialists. G. E. HODGE

The Common Diseases of the Skin: A Handbook for Students and Medical Practitioners. R. Cranston Low, M.D., F.R.C.P., Lecturer on Diseases of the Skin, University of Edinburgh, and Physician to the Skin Department, Royal Infirmary, Edinburgh. 223 pages, 68 illustrations. Price 14/- net. Oliver and Boyd, Edinburgh, 1927.

Dr. Low has embodied in his manual for students and practitioners the lectures which he is accustomed to give to his students. All of the commoner, and many of the rarer skin diseases, are dealt with. Syphilis is not included in this treatise as a separate study, but only in connection with the differential diagnosis of some skin diseases.

As the author says: "In teaching one must be dogmatic," and the views and facts which time has shown to be sound are given prominence. In addition to this, the author gives us ideas and pointers based on his own rich experience and research.

His chapter on eczema is well worth reading. He classifies dermatitis or eczema in two main groups: First, traumatic dermatitis. These cases are non-sensitization types which have reacted to a strong chemical irritant. They are mainly occupational in origin.

Second, sensitization cases. These are according to the author due to plant bacterial and food antigens. This classification is essentially sound. He recognizes well that eczema may be caused by internal toxins coming from some source and reaching the skin, via the blood-stream. He makes no mention of the recent work done in regard to the influence of carbohydrate metabolism in eczema.

The book is well illustrated and easily read. It should be a very useful handbook for students of dermatology and may well be recommended. J. F. BURGESS

A Practical Treatise on Diseases of the Skin for the Use of Students and Practitioners. Oliver S. Ormsby, M.D., Clinical Professor and Chairman of the Department of Dermatology, Rush Medical College, of the University of Chicago. Third edition. Price $11.00. Pp. 1262, with 524 illustrations. Philadelphia: Lea and Febiger, 1927.

This is the third edition of a standard work on the skin. In the preface the author points out that several sections of the book have been rewritten, that thirty new diseases are described, and that seventy-six new illustrations have been added.

There are very few inconsistencies or omissions. One notices that on page 72, leprosy is mentioned as

the example of a disease transmitted by the bedbug, and on page 865 it is stated that "the rôle of the bedbug in the transmission of leprosy is undetermined." In an excellent discourse on the Luetin reaction, there is no reference to false positives, which may occur if the test is performed after the ingestion of potassium iodide; and there is no mention of the control of arsphenamine administration by liver-function tests, such as the Van den Bergh and Icterus Index. The author sees only four layers in the epidermis, preferring to include the germinal layer with the rete. But these are very minor faults in a book of considerable merit. The first 100 pages, dealing with anatomy, physiology, and histopathology, are outstanding for their clearness, completeness, and conciseness.

In dealing with diseases of the skin, the author follows Hebra's classification, and has selected those procedures and methods of treatment which are accepted by the majority of dermatologists. In many instances, he indicates those forms of treatment which he particularly favours. The references to the literature are not complete, but those given will be found to contain complete bibliographies.

The book is well written, covers the entire field of dermatology, and can be recommended for students and practitioners. HAROLD ORR

Urography. William F. Braasch, B.S., M.D., F.A.C.S. Second edition. 480 pages, 759 illustrations. Price $13.00. Philadelphia and London, W. B. Saunders Co.; Toronto, McAinsh & Co., 1927.

The first edition of this work appeared in 1915 under the title of "Pyelography." Since that date, the roentgenological delineation of the urinary tract by the injection of opaque fluids has been extended to all its parts. To include the various regional terms of pyelography, ureterography, cystography, and urethrography, Braasch has used, if he has not coined, the more comprehensive term of urography, under which title the second edition is now published. The work has been revised and much enlarged, and keeps pace with all the advances in this important field of urology. The book's chief value lies in its wealth of illustrations, 759 in all, which are a tribute to the extensive material from which they are derived. The success in their selection, and the technical skill in their reproduction render the book an invaluable compendium to the roentgenologist and urologist.

The first successful demonstration of pyelography was by Voelcker and von Lichtenberg in 1906. In its subsequent development, and its elevation as an aid in diagnosis, probably the urologist's most valuable one, Braasch has played a most conspicuous, if not outstanding rôle, and it is fitting that he should be the author of the most valuable work at our disposal on the subject.

The first chapter is devoted by the author to an historical summary of the method. Following this the technical requirements of the method are fully described, the normal renal pelvis and ureter illustrated, and the various pathological lesions in the urinary tract illustrated in detail, with much good advice in their interpretation. Particularly valuable are the sections dealing with lesions, which the average urologist encounters infrequently, and of which the extensive material of the Mayo Clinic makes possible a wide selection, for example, renal tumours, and polycystic, and horseshoe kidneys. A minor critical detail may be suggested, in that the uses of lateral pyelography are not touched upon in the differentiation of extra-renal and extra-ureteral shadows.

In addition to the excellence of the illustrations the book is well indexed and printed, and, all in all, is a most invaluable work of reference for both the roentgenologist and the urologist. F. S. PATCH

Potassium and Tartrates. Ralph W. Webster, Ph.D., M.D. 168 pages. Price $2.50. The Commonwealth Press, Inc., Chicago, 1927.

This little book consists, first, of 19 pages devoted to an extremely superficial summary of physiological knowledge concerning potassium and tartrates, and, secondly, 128 pages devoted to abstracts of articles on these subjects which, to some extent at any rate, are merely copied from an abstract journal. Any slight value the book may have attaches to the bibliography, but this is not complete. Not many books have less reason for existence. R. D. STEHLE

Affections of the Stomach. Burrill B. Crohn, M.D. 902 pages, 361 illustrations. Price $13.00. Philadelphia and London, W. B. Saunders Co.; Canadian Agents, McAinsh & Co., Toronto, 1927.

This appears to be essentially a volume based upon material studied in the clinical laboratory, and pathological departments of Mount Sinai Hospital, with a careful review of the general literature of the subject. The writer has not neglected to incorporate and evaluate the recent additions to our knowledge of gastric secretion and its disturbances, of roentgenography and cholecystography, and the changing viewpoints, physiological and technical, regarding gastric surgery. The opening chapters deal with the anatomy and physiology of the stomach, the mechanism of its motility, the nervous regulation of its function, the physiology of hunger, and the fasting contents. This is followed by a consideration of test-meals and tests of the gastric contents. An excellent chapter on radiography precedes the consideration of physical examination, which leads up to the classification of gastric diseases and a consideration of symptoms and their significance. Functional and organic diseases are dealt with in detail, and treatment is dealt with fully. There is a wealth of illustration, relating to anatomy, pathology, and technical study, which adds to the value of the text, particularly to the practitioner who has no opportunity to study original material. The author has succeeded in adding another good volume to a number already published, dealing with the modern study of the pathology and treatment of gastric disease. J. H. ELLIOTT

Fighters of Fate. J. Arthur Myers. 318 pages. Price $3.00. Williams & Wilkins Company, Baltimore, 1927.

The author does not need an introduction to medical readers, as he is well known as a teacher and as a writer on tuberculosis. But this book is not for the medical profession only. It appeals to all types of readers. Dr. Charles H. Mayo contributes an interesting and sympathetic introduction, and then follow short biographical sketches of twenty-four "men and women who have achieved greatly despite the handicap of the great white plague." Dr. Myers has shown much astuteness in his selection of characters: he has included representatives of various nationalities and various professions, and has given places to the living as well as to the dead. So there is something to excite the interest of everyone. The medical reader will doubtless be tempted first to read about Bichat, Laennec, and Trudeau, then about Schiller and Keats who deflected from our ranks, then about McDugald McLean and Lawrason Brown. Thus intrigued, he will be unsatisfied until he has learned about all of those of whom Dr. Myers has written so interestingly. The litterateur may perhaps begin with the chapters on Eliabeth Barrett Browning, or Dostoievsky, or Will Irwin, but he will finish the book. And the trap has been set with equal skill for the artist, the musician, the financier, the baseball player, *et al.* The book is intended to bring encouragement and stimulation to such as may be dispirited under affliction, but the motive is apparent only in the foreword, and it can be read by

anyone with pleasure and profit. The doctor will assuredly place it on his consulting-room table.

W. H. HATTIE

The Medical Clinics of North America. Vol. II, No. 2. St. Louis Number. W. B. Saunders Co., Philadelphia. McAinsh & Co., Toronto, September, 1927.

This volume continues to maintain the usual high standard for this publication. It contains six hundred and sixteen pages of material which is of interest to the internist, pædiatrist, and general practitioner alike. The contributors belong entirely to the University of Washington and St. Louis University.

The articles are concise and contain only what is of practical value to the practitioner. The first contribution is on essential hypertension and lays stress on the fact that treatment, if it is to be of any avail, must be instituted at a time when the arterial tree still retains its elasticity. The range of subjects taken up is extremely varied and in the great majority of cases consists of clinical cases.

The closing contribution is one on the diagnostic value of calcium therapy and points out that, to date, practically the only diseases benefitted by calcium therapy are rickets, tetany, and certain diseases of the bone.

The edition is undoubtedly an acquisition to anyone's library.

L. C. MONTGOMERY

A Text-Book of Therapeutics, Including the Essentials of Pharmacology and Materia Media. A. A. Stevens, A.M., M.D., Professor of Applied Therapeutics in the University of Pennsylvania. Seventh edition. 8vo. 758 pages. Price $6.50. Philadelphia and London, W. B. Saunders Company. Canadian Agents: McAinsh & Company, Toronto, 1927.

Previous editions of this well known text have received favourable notice in these columns. Much new matter has been added in this most recent edition, in which the names and composition of the various official preparations have been made to conform with those of the Tenth Decennial Revision of the United States Pharmacopœia.

J. H. Elliott

Clinical Diagnosis by Laboratory Methods. J. C. Ford, Ph.B., M.D., Professor of Clinical Pathology, University of Colorado and A. H. Sanford, A.M., M.D., Professor of Clinical Pathology, University of Minnesota. Sixth edition, 8vo., 748 pages, 346 illustrations. Price $6.00. Philadelphia and London, W. B. Saunders Company. Canadian Agents: McAinsh & Company; Toronto, 1927.

The first edition of this manual appeared in 1908, the fifth, which this supersedes, in 1923. The matter has been brought up to date. Great emphasis is placed upon microscopic morphology, yet a full description is given of laboratory methods in general use, such as kidney-function tests, sugar tolerance, serodiagnostic methods, vaccines, protein sensitization, the study of puncture fluids and of animal parasites. It is to be recommended as a reliable manual of laboratory diagnosis, well illustrated and concise.

J. H. ELLIOTT

The Foundations of Nutrition. Mary Swartz Rose, Ph.D., Professor of Nutrition, Teachers' College, Columbia University. 501 pages, illustrated. Price $3.00. The Macmillan Co. of Canada, Toronto, 1927.

This book of 501 pages is based upon the author's experience in presenting the subject of nutrition to beginners, whose object is to be well informed as to the significance of food in daily life. Food is considered from the standpoint of the energy that it must contain, and also with due regard for the various factor which we have come to recognize as indispensable for the continued well-being of the animal, aside from the intrinsic energy content of such factors. Full directions therefore are presented for the construction of adequate diets for general and special needs.

A novel feature in the book is the use of the term "share," to indicate a 100-calorie unit of food energy plus the corresponding amount of all other necessary food factors for an adequate diet. A man who requires 3,000 calories per day, therefore, needs 30 "shares." The author expresses the belief that the understanding and calculation of food-requirements is simplified by thinking of the daily requirement of 3,000 calories as 30 "shares," each one of which, necessarily, contains one-thirtieth of the daily requirement of each necessary constituent. The subject matter is presented in an interesting style.

SIDNEY BLISS

Modern Aspects of the Diagnosis, Classification and Treatment of Tuberculosis. J. Arthur Myers, University of Minnesota, with an introduction by David A. Stewart, Manitoba University. 8vo., x+271 pages, 34 illustrations. Price $3.75. Williams and Wilkins Co., Baltimore, 1927.

The title of this volume indicates its scope. The author, who is described by our own David Stewart in his foreword as essentially a teacher, presents to students and physicians a comprehensive, yet well condensed, survey of tuberculous infection and disease, its onset, course, diagnosis, and treatment. It is up to date in every way and gives the relative values to various methods employed in diagnosis and treatment.

The book is an extremely practical one. The author clearly states our present conception of tuberculous infection and the varying parts played by immunity and lowered resistance. His picture of the disease process in its various clinical forms should make the subject clear to the student. Healing and fibrosis are described in such a way as to make clear to the physician the indications for treatment. Proper emphasis is laid on the influence of rest in the relief of symptoms and in the arrest of disease. Special methods, such as pneumothorax and thoracoplasty, are well described, with indications for their employment in therapy. With his extensive experience in childhood tuberculosis, the portion of the book dealing with this phase of the disease is of especial interest. Careless proofreading mars the book, but has not impaired its value. Recent North American literature on tuberculosis is freely quoted and much of Stewart's work is incorporated. We heartily recommend the book to the physician who has cases of tuberculosis in his practice, and to the student who wishes a modern survey of the subject of tuberculosis.

J. H. ELLIOTT

Diagnosis and Treatment of Diseases of the Stomach. Martin E. Rehfuss, M.D. 1236 pages, 519 illustrations. Price $13.00. Philadelphia and London, W. B. Saunders Co.; Canadian Agents, McAinsh & Co., Toronto, 1927.

The author describes this work as a practical volume devoted to the everyday problems in diseases of the stomach and digestive tract, and representing the modern approach to this field. The past twenty years have given us much new information regarding gastric disease. Added to our older knowledge of gross and microscopic pathology and the earlier studies of the physiology of digestion, we have the modern researches in radiology and the constantly increasing knowledge gained by surgical observation and treatment. The biochemist and the physiologist have made valuable contributions in recent years, and there is every indication of farther advance in their researches. The work is well-balanced in its presentation of the various aspects of the study of the

physiology and pathology of the stomach and its secretion is fully described and there is a very full chapter on food digestion. Special contributors have dealt with certain phases of the subject, such as gastric surgery, gastroscopy, cholecystography, bacteriology and allergy, and diseases of the œsophagus.

The volume is to be commended as a text-book on gastric diseases and their treatment and one affording a fine presentation of modern technique in the study and investigation of normal and pathological processes in the upper gastrointestinal tract. J. H. ELLIOTT

Pharmaceutical Botany. Heber W. Youngken, A.M., M.S., Ph.M., Ph.D. Fifth edition. 692 pages, 387 illustrations. Price $5.00. P. Blakiston's Son & Co., Philadelphia, 1927.

The fifth edition of this work has been made the more necessary by the issue of the new United States Pharmacopœia and National Formulary, and the author has also taken the opportunity of making alterations and enlargements of considerable extent. This policy of improvement has been followed in each successive edition, and the book as it now stands bears evidence of a careful selection of material for students in pharmacy and medicine. The illustrations deserve a special note of praise for their clearness.

International Clinics. Edited by Henry W. Cattell, A.M., M.D., and others. Vol. III, 37th series. Price $2.50 for one volume, $10.00 for the set of four. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1927.

This volume opens with an interesting review by Dr. Theobald Smith of the passage of disease from one generation to another, with some account of the processes by which this transmission is controlled. Dr. Smith makes it evident that the natural defences of the body against disease are not very efficient, but they unquestionably tend to save life in its earliest stages. Interference with these defences may result either in the rapid destruction of life, or in the production of open disease later on.

Dr. Chas. E. Simon discusses the virus of herpes simplex. He thinks that the herpetic virus is one which may have the capacity of developing pathogenic qualities, but probably only does so under special circumstances.

Dr. H. I. Goldstein presents a résumé of the literature on pneumococcic meningitis and endocarditis. The conclusion as regards treatment is that the best results are obtained from early repeated spinal and cisternal lavage and drainage, using injections of specific sera in combination with ethylhydrocupein hydrochloride.

The series include further papers on surgical and neurological subjects, a paper on Greek medicine by Dr. J. R. Oliver, and discussions on post-graduate study by Drs. H. Cattell and W. S. Cornell.

Medical Clinics of North America. Vol. X, No. 6; Vol. XI, No. 1. Price $2.00 each. Philadelphia and London, W. B. Saunders Co., Toronto, McAinsh & Co., 1927.

The May number is devoted to a discussion of cardiac disease, and the various methods of diagnosis now in use. The contents of the volume afford a good repetition of the not so very ancient feeling that there was little to be added to our knowledge of the heart and its disease. Our improvements in diagnosis only reveal how much more there is to be investigated.

The July number (vol. xi, No. 1) includes papers from the clinics of various Chicago hospitals. Dr. Pollock reports a series of cases of aneurism of the cerebral vessels. Dr. Feinberg describes cases of bronchial asthma due to house dust: treatment with extracts of the dust were of considerable benefit. Several other papers are included, dealing with pulmonary, abdominal and skin diseases, as well as with disorders of the blood.

Text-Book of Pathology. Francis Delafield, M.D., LL.D., Sometime Professor of the Practice of Medicine, College of Physicians and Surgeons, Columbia University, and T. Mitchell Prudden, M.D., LL.D. Fourteenth edition. 1339 pages, 826 illustrations. Price $10.00 net. William Wood & Co., New York, 1927.

The authors of this well-known text-book on pathology have spared no pains in keeping each edition well up to date. This is shown, for example, in their inclusion of such subjects as vitamins and hormones. There is also an excellent note on the action of light on the organism.

This is an admirable teaching manual. No single volume can ever pretend to cover the entire field of pathology, but it can provide judicious selection and full references to sources of information, and the authors of this text-book have succeeded especially well in this respect. H. E. MACDERMOT

Surgical Clinics of North America. Vol. 7, No. 4. The Brooklyn Hospital number. 314 pages, illustrated. Philadelphia and London, W. B. Saunders Co. Canadian Agents, McAinsh & Co., 4 College St., Toronto, 1927.

This booklet of 313 pages contains 37 short contributions by the surgical staff of the Brooklyn Hospital. The articles deal with the less frequently discussed phases of routine surgical practice, and are collected from studies of cases presented by members of the hospital staff at the weekly conferences of the department. Case-histories and frequent illustrations add to the interest and value of the subject matter.

A clinical and autopsy record of a case of recurrent ulcerative colitis, and case reports of four cases of Paget's disease of the bones, supply valuable material in two lesions which are under much discussion in modern literature.

An operation is described for cancer of the breast in which the skin of the axilla is removed in an attempt to complete the radical operation without opening into tissue invaded by the malignant process.

Operable cases of hydrocephalus in infants are described, as having been treated with some success by extensive section of the corpus callosum by means of a broad spatula introduced through a trephine opening.

In acute osteomyelitis in long bones the opinion is expressed that operation upon the bones themselves should be withheld if possible until definite x-ray evidence of bone destruction is obtained. One half of the circumference of the affected bone is then removed from healthy marrow to healthy marrow, and subsequent treatment carried out by the Carrel-Dakin technique.

Support is given to the modern trend of opinion in avoiding digitalization as a pre-operative measure, excepting in cases of obvious heart failure. If the drug be slowly administered to patients with normal hearts there is definite danger of the development of irregular action, and even of auricular fibrilation.

A method is described by which *B. ærogenes capsulatus* can be detected within two hours. The suspected material is injected into the traumatized liver of a guinea pig. The animal is killed and placed for two hours in an incubator. Smears of the peritoneal fluid then reveal the organism.

An interesting paper describes three cases of neoplasm originating in the region of the ileo-cæcal valve. All three cases were complicated by intussusception.

R. R. FITZGERALD

ANÆSTHESIA

An Ether Song-cycle, in Eight Stages

Realization
Swift as the levin-dart across the blue
—Pain.
Then, for a space, surcease; and then, anew,
Anguish again.
Anon, the torture of a sickening dread
Assails the soul,
Life's summer sky grows dark, and overhead
The storm-clouds roll.
The dread increases and the pain assumes
A Shape of Fear,
By day and night the haunting Terror looms
And Death draws near.

Consultation
Once again—
Pain!
And, though heart-beats should falter, brain burst,
I must needs know the best, or the worst!
Though the verdict be Death,
With my last failing breath
I'd cry "Truth! Give me Truth!"
Show no ruth!
Truth!

Consolation
Hope, did you say? Did I hear you aright?
What! you "think we should win in this fight
I, with courage, and you, with your skill?"
By the mercies of God, so we Will!
I can cope
With the pain, now there's Hope—
Hope!

Preparation
Anticipation
Resignation
T'is night; I cannot sleep,
(O, my Love! O, my Love!)
Slowly the hours creep
Till Dawn brings Day.
Before the golden Sun
Has half his journey done
Toward the West,
I may have passed away.
Ah, well! God knoweth best.
And so, I pray,
Guard her I leave behind;
Give me a quiet mind,
And, of Thy grace,
(If I must die to-day—
And no more see her face—
My one, sweet Love!—)—
—Grant me this boon I pray,
That, at some future day
We in Thy Heaven may together be;
And so . . . .
"In manus tuas, Domine!"

Etherization
Aeons on aeons ago—
(*"Breathe deep....breathe slow."*)
—I heard that wonderful chime,
Exquisite—rhythmical—sweet!
Now t'is the knell of despair!
God! How my mad pulses beat!
Fiends! Give me air—Give me air!
Ha! Now, I'm climbing the sky!
Glorious!....the wind rushing by!
(*"Breathe slow, Breathe deep."*)
Endless....that d-r-o-n-e of the plane,
Ceaselessly maddening my brain!
Torture!....that aeroplane's song!
Torture....for centuries long!
Oh!....if I only could sleep!
Sleep!....(Suffocation, not sleep!)
(*"Breathe slow, Breathe deep."*)
Down, ...sinking down....ever down,
Crushed by the weight of the world.
Honour and fame and renown,
All, into nothingness hurled:
Self has no entity there;
There is no future, no past,
Hatred, nor love, nor despair.
(*"He is under—he's under at last!"*)

Operation
Sleep, all enfolding sleep!
Wrapped in oblivion deep,
The shuddering Spirit swoons its way.
Down the dark abyss, from the blessed Day
To the realms of the living dead,
Two worlds between;
While, in the skilled hand overhead
The saving knife cuts clean.
Eerie, and ghast, and lone
Is that gloomy borderland;
Unplumbed its depths; unseen, unknown,
Its drear and dismal strand.
Aeons on aeons elapse.
Light cannot penetrate here;
Blackness and darkness profound,
From the upper world no sound;
With the last link that snaps
Comes silence, that smites the ear.....

Ether Dreams
Re-incarnation
Deep, deep, fathoms deep,
Drowned men sleep their last, long sleep;
While, above them, evermore,
Rooted fast in ocean's floor,
Emerald fans of sea-weed grow,
Waving softly, to and fro.

Death! Is this Death? Am I *dead?*
Once, in the world overhead,
(Far above....O....far..
Ages and ages ago....
Something existed, called....*"Me"*....
—Now, there is naught but this sea,
Naught but these surges that roll,
Whelming me, body and soul,
Caught in the ebb and the flow—
Moving, supine, to and fro.

To....and fro....To..and fro....
(*Breathe deep....breathe slow....*)
(Far above....O,....far..
Somewhat....called "Love"
Shines,....like a star.
If——Love——should—call——
I must leave..all....
..And....
Go!

Restoration
Through dark
A spark:
Through night
A light:
Far off
A call!....
Dear Love! I come, I come!
T'is past—all past!
Thank God!—at last
T'is Love,—and Life—and Home!

Edith J. Archibald
Halifax, N.S.

CONCERNING LUMBAR PUNCTURE

There is a certain amount of disagreement about the readiness with which lumbar puncture should be done, whether for diagnostic purposes or for estimating the effects of treatment. Of its value for both these purposes there can be no question, but from the patient's point of view the operation is at best unpleasant, and however skilfully performed, it is not altogether free from the risk of uncomfortable after-effects. It is true that fear of the unknown accounts for most of the patient's aversion, and those who have been frequently punctured become almost indifferent; but the after-effects may undoubtedly be very trying, and if lumbar puncture were employed indiscriminately the proportion of cases in which troublesome sequelæ occurred would be considerable. As long, however, as it is confined to cases of organic (or suspected organic) nervous disease, and reasonable precautions are taken, the percentage of patients who suffer any serious discomfort will be small. Disseminated sclerosis seems to render subjects particularly liable to rather prolonged headache after the withdrawal of even a little fluid; cerebellar tumours and cerebral tumours in certain situations provide a not inconsiderable risk of death if lumbar puncture is performed otherwise than with the greatest care; but in other organic nervous diseases—neurosyphilis, meningitis of all kinds, encephalitis, poliomyelitis, spinal tumours, and the like—lumbar puncture is well borne and often gives relief. Where there is no organic nervous disease and no pathological change in the cerebro-spinal fluid, unpleasant after-effects, such as severe headache, nausea, and vomiting, seem to occur rather more often, and in doubtful cases we should beware lest the advantages outweigh the possible disadvantages. Syphilitic infection so often affects the central nervous system that it is certainly of some importance to know when changes of a syphilitic nature are present in the cerebro-spinal fluid, though the knowledge gained can make little difference to treatment as long as the Wassermann reaction in the blood is positive. Examination of the cerebro-spinal fluid may be advisable, as Colonel L. W. Harrison points out, when there is difficulty in rendering the blood Wassermann negative, and before any syphilitic patient is discharged from treatment.

The cause and prevention of the untoward symptoms that sometimes follow lumbar puncture are discussed in the *Presse Médicale* of August 13th by Dr. J. Mouzon, who considers that they are due either to hypotension or hypertension of the cerebro-spinal fluid. Hypotension may be brought about and sustained by the escape of fluid into the subdural space and tissues through the puncture in the membranes made by the needle, whilst hypertension is attributable to irritation of the dura, which reflexly stimulates production of cerebro-spinal fluid. In hypotension the symptoms come on at once but are less prolonged; they are often accompanied by muscular weakness, tachycardia with low blood pressure, and oliguria; the effect of posture on the headache is marked. In hypertension the onset is slower and the symptoms last longer; posture has little effect on the headache, and there may be slight mental confusion, and tachycardia without low blood pressure. As means of preventing symptoms after puncture, the head should be kept low and the hips raised by a pillow. All muscular effort by the patient should be avoided during the puncture and for some hours afterwards. When the needle is felt to be through the dura, but the fluid does not flow at once, the needle should only be moved slowly and cautiously after a short interval, and should not be hurriedly withdrawn and inserted again. The fluid often comes slowly at first; it should never be withdrawn quickly, and no more should be taken than is necessary for diagnosis. The patient should lie in the lumbar puncture position for 20 minutes and then be rolled slowly over on to his back. After a few hours his head may be raised with pillows and food can be given, and in 24 hours he may get up. With these precautions, according to Dr. Mouzon, most of the unpleasant sequelæ are avoided.—*The Lancet.*

LEPROSY IN PARIS

The Paris Municipal Council is considering measures for the control of leprosy, its action being urged because there is a tendency on the part of lepers from various countries to seek the treatment afforded by the Hôpital St. Louis and other Paris hospitals. The new measures contemplate isolation of the cases in a special ward at the Hôpital St. Louis, obligatory declaration, domiciliary control by therapeutic and bacteriological methods, exclusion of lepers from occupations such as hairdressing, laundries, and the cooking and sale of foods, and the creation of leprosariums and the elaboration of arrangements with foreign countries with a view to restriction of the immigration of lepers into France.